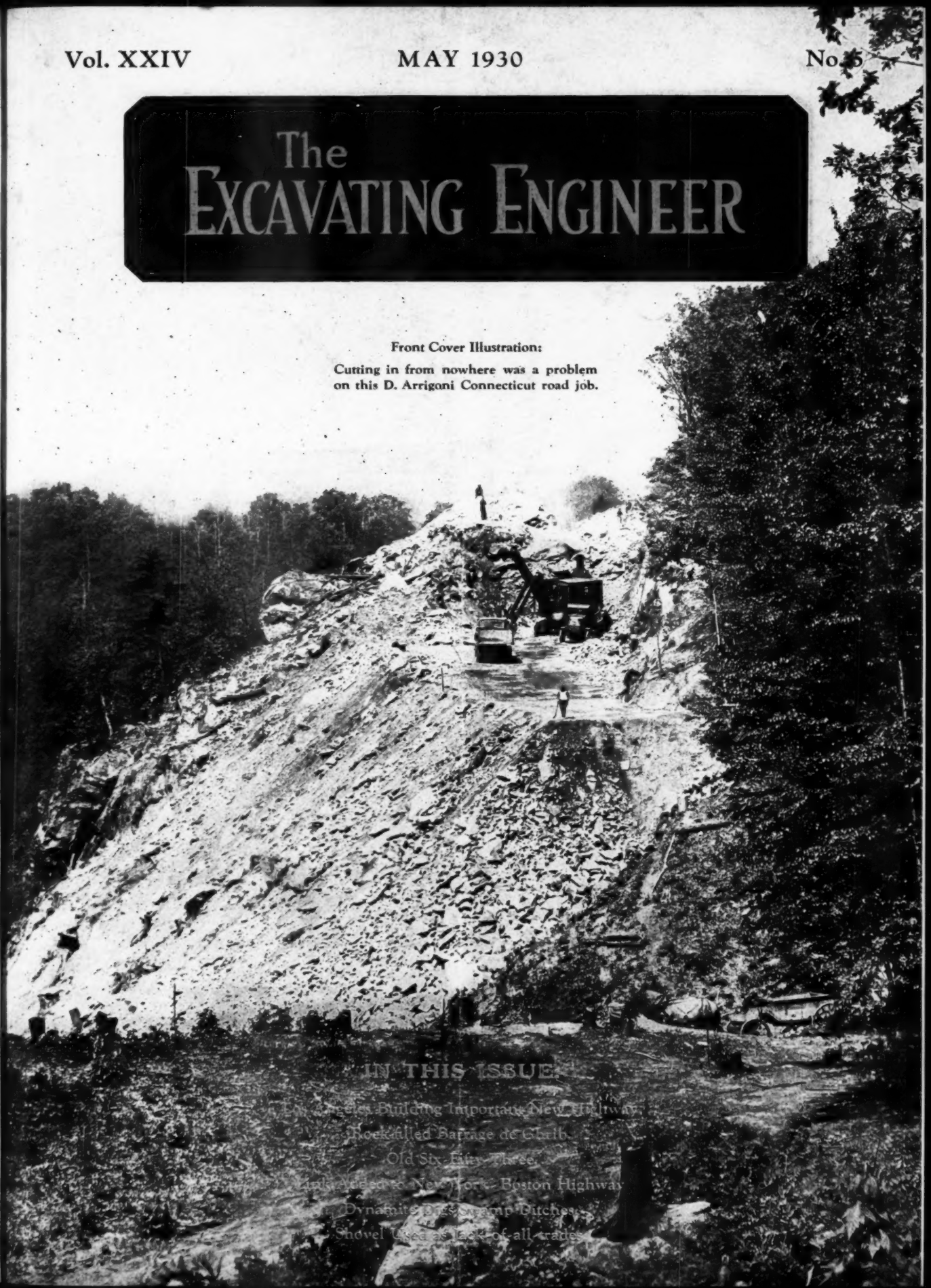
Vol. XXIV MAY 1930 No. 5

The EXCAVATING ENGINEER



Front Cover Illustration:

Cutting in from nowhere was a problem on this D. Arrigoni Connecticut road job.

IN THIS ISSUE

Engineers Building Important New Highway

Rockfilled Barrage de Gurib

Old Six-Fifty-Three

Links Added to New York - Boston Highway

Dynamite Digs Swamp Ditches

Shovel Used as Tool of all Trades

ONLY ONE OPERATING CLUTCH ON THIS GAS SHOVEL

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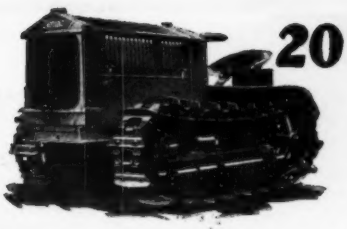

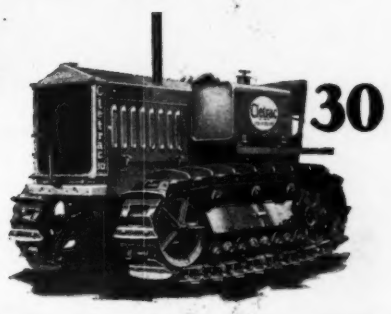

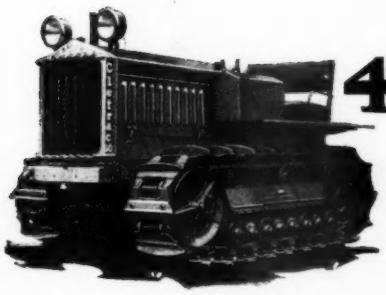

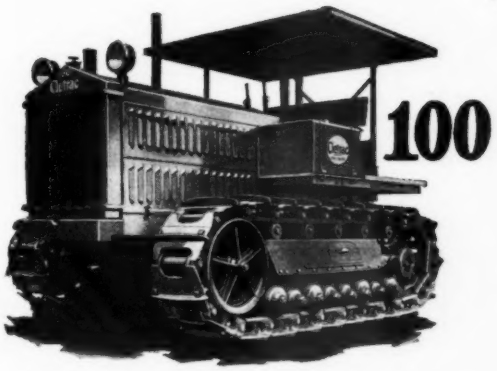

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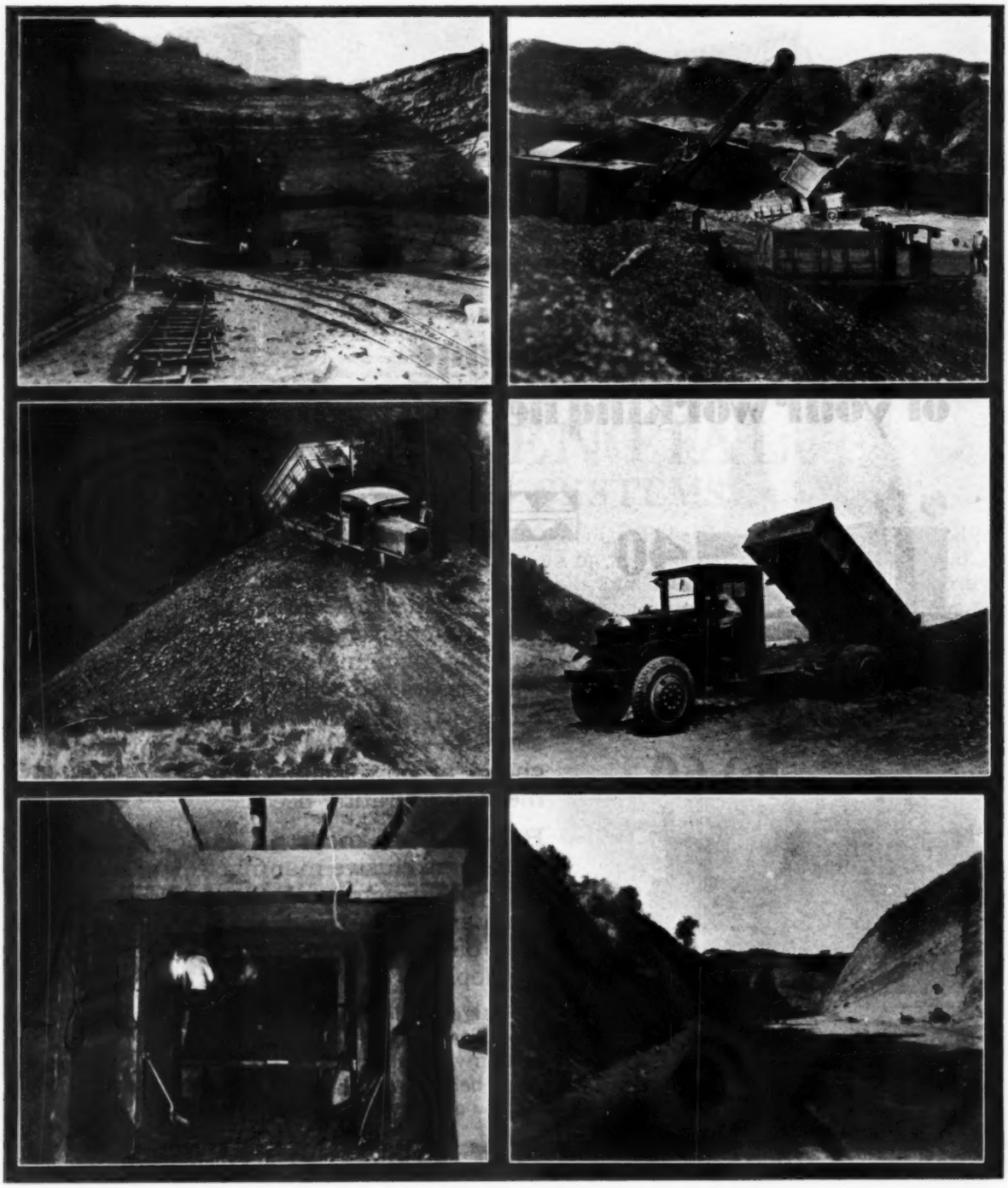


Cutting through the Santa Monica Mountains.

1. Close-up of north portal, showing drifts. The white lines leading into each drift are canvas tubing used to exhaust the gases from blasting.

2. Bucyrus-Erie Gas + Air shovel loading Linn tractor in loose shale cut. The cleared right-of-way may be seen in the background.

3. Linn tractor dumping into fill.

4. Republic truck on the dump.

5. Miners working in one of the tunnel drifts showing details of timbering and auger steel used for drilling through most of the formation encountered. Note Trojan powder boxes used to support scaffold.

6. Portion of the roadway looking towards the south portal of the tunnel prior to the holding through of the drifts. Two buildings of the camp may be seen in the middle background.

The EXCAVATING ENGINEER

Vol. XXIV MAY 1930 No. 5

Los Angeles Building Important New Highway

Bucyrus-Erie Gas + Air shovel loading Linn tractor in hard sandstone cut.

J. G. Donovan & Son cutting tunnel and handling half-million yards on Sepulveda Boulevard construction.

SEPULVEDA BOULEVARD, as projected, is one of the most important highways of the great network that serves Southern California. When completed, it will give access to San Pedro Harbor from San Fernando Valley and points north, over a road designed to meet the present-day traffic conditions, and one that will materially shorten the distance between the valley and the harbor.

The City of Los Angeles is now constructing the portion of this road between Ventura Boulevard and Wilshire Boulevard, which involves the grading of 7.65 miles of roadway 54 feet wide, with a maximum gradient of 4½%, and the construction of the tunnel, 656 feet long, which will carry Sepulveda Boulevard under Mulholland Highway.

In addition to the tunnel above mentioned, the major items are 500,000 cubic yards of roadway excavation, and considerable storm drain and structure work.

Cuts Run Through Santa Monica Mountains

For the greater part of the length, this section of the road traverses the Santa Monica Mountains, and cuts from fifty to sixty feet in height are very common with fills of corresponding size, the formation generally being of medium hard sandstone and shale. At this time, the grading is practically completed.

North portal during driving of drifts, showing locomotive, cars and bunker for handling excavated material from top drift. The concrete placing guns were later mounted on top of this bunker and charged with concrete from the wooden hopper shown at the extreme top, which was fed from the mixing plant located just above where the man is seen in the upper left-hand corner of the photograph.

Two Bucyrus-Erie ¾-yard steam shovels were used on the south end of the work, the tunnel being the dividing part almost in the middle of the job, and on the north, two Bucyrus-Erie Gas + Air shovels and one Model 5 Northwest shovel were used.

Two Methods Used for Compacting Fills

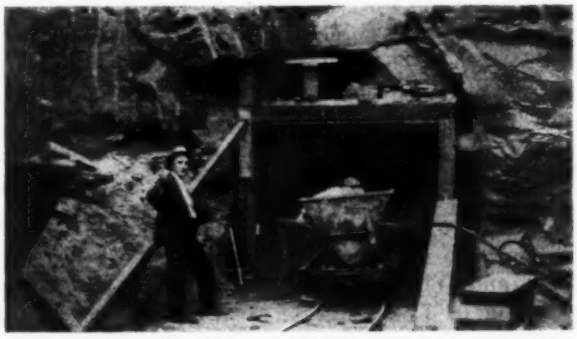
It was required that the fills be compacted, which was done by two methods, depending on the characteristics at the particular location. One method was by spreading the excavated material and compacting with a roller; the other, by end dumping and flooding.

The contractors did most of the hauling with their own equipment, consisting of four Republic dump trucks carrying four-cubic-yard bodies, and four Linn tractors carrying eight-cubic-yard bodies, supplemented by other dump trucks as required. Two Austin rollers, and two Caterpillar tractors, one "30" and one "60," together with blades and other allied equipment were used for compacting the fills. Some drilling and blasting was required and was done with Ingersoll-Rand jackhammer drills; the compressed air being furnished by Ingersoll-Rand and Chicago Pneumatic portable compressors.

The contractors installed a hundred-man camp at the tunnel site, and are at present doing enlargement work in the tunnel, and placing the concrete lining.

Concrete Work at Mulholland Highway Tunnel Handled by Well-Planned Plant

The air plant for tunnel construction consists of one 1200-cubic-foot Chicago Pneumatic com-



J. G. Donovan standing beside lower left drift at north portal of tunnel at commencement of driving.

pressor, and one 300-foot Ingersoll-Rand compressor, both of stationary type and driven by electric motors. When concrete is being placed, these machines are supplemented by four portable compressors.

The concrete plant consists of a cement storage shed, aggregate bunkers with a capacity of 350 tons, 28S Koehring mixer, and two 14-cubic-foot Ransom-Pneumatic concrete placers. The entire concrete plant operates by gravity, the bunkers being placed on the hillside, below the level of Mulholland Highway, so that the material trucks can dump directly into them. The cement shed is also on the Mulholland Highway level, and an

Grading the Sepulveda Boulevard.

enclosed chute carries the sacked cement from the shed to the mixer, which is located beneath the bunkers. The aggregate is proportioned by weighing; three sizes of rock and sand being used. From the mixer, the concrete flows through a covered chute to a hopper, which discharges into two measuring boxes, placed one above each concrete gun. At the beginning of lining operations, the concrete was shot through these guns, a distance of 700 feet through a six-inch line — this distance of course decreasing as the lining is carried forward.

Three Drifts Used to Open Tunnel

The first work on the project was the excavation of the portal cuts at each end of the tunnel, followed by the driving of three drifts the entire length of the tunnel, one at the crown of the arch, and one at grade on each side, the drifts being about ten feet wide and eight feet high. These drifts were timbered throughout their entire length. After their completion, the footing excavation along each side was made, and the concrete

A Linn negotiating a 30% grade carrying 12 yards of excavated material.

footings poured. At present, enlargement work, or the removal of the material between the tops of the bottom drifts, and the sides of the top drifts is being carried forward, together with the placing of the concrete lining.

The contractor started work on September 1, 1929, and expects to complete the entire project by September 1, 1930. The contract was secured by J. G. Donovan & Son for the sum of $537,000. The members of the firm are J. G. Donovan, J. L. Donovan and T. M. McDaniel. Mr. McDaniel has had supervision and direct charge of this project, assisted by H. B. Howard as general foreman.

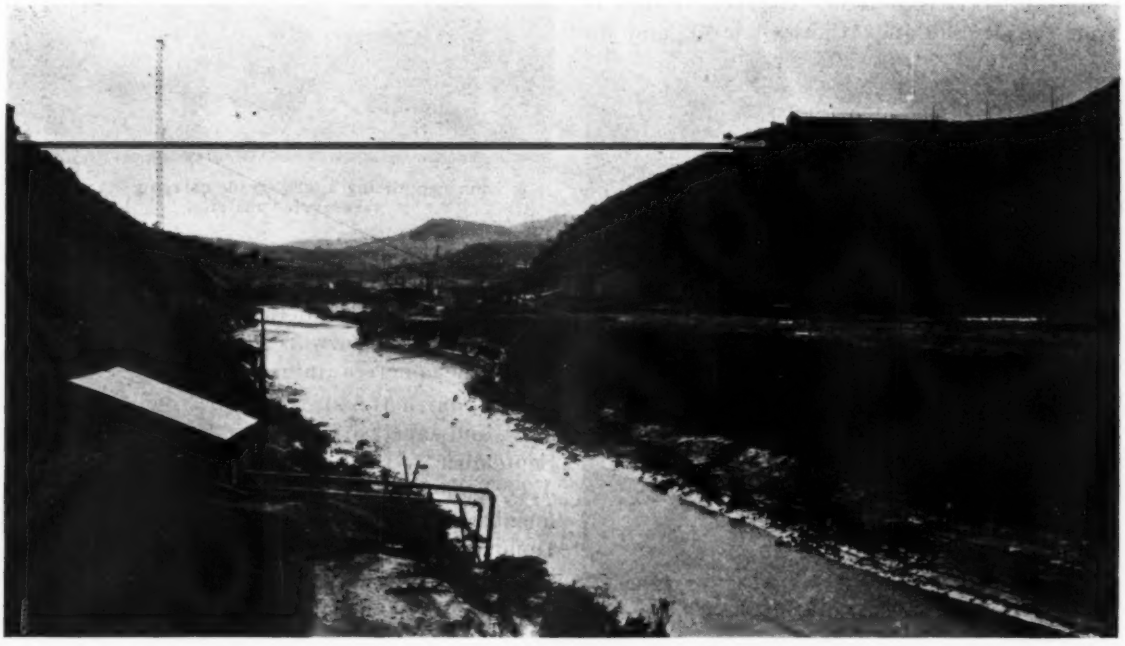
Cutting Through Algerian Hills

This smiling operator is waiting for them to bring in some more empties. He is running a Bucyrus-Erie B-2 for a prominent firm of French contractors who are doing work in Algeria.

Cop: "Hey, where are you goin'?"
Drunk (crawling on stomach along sidewalk): "I'm gonna climb this wall if it takes all night."

Rock-filled Barrage De Ghrib to Irrigate Algerian Plain

Modern shovels used by famous French contractor in building large dam in Northern Africa.



General view of site of operations at Barrage De Ghrib. Red line shows approximate height to which dam will be built. Concrete tower under construction at left.

EIGHTY miles up country from Algiers, near the village of Dollfusville, a rock-fill dam is being constructed across the valley of the River Cheliff, for the purpose of conserving water for irrigation purposes.

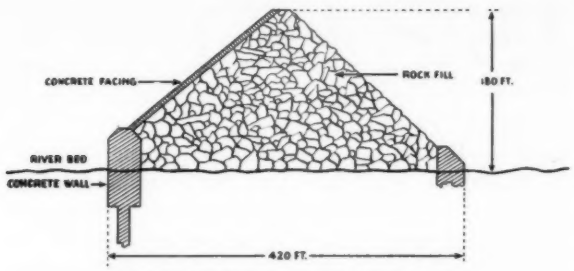
The site chosen for the dam is in a wild and hilly district inhabited by small and scattered communities of Arabs, among whom a good deal of the labor required has been recruited.

Some miles below the site of the dam lies a rich and fertile plain, which, owing to lack of water in the summer months, presents a dry and barren aspect, and it is to exploit this plain that the Barrage de Ghrib is being constructed.

There is much tough digging in the 530,000-cubic-yard by-pass excavation being handled by this sturdy Bucyrus-Erie 2-yard electric.

Same Famous French Contractors Built Five-Mile Rock Canal Tunnel du Rove

The construction of the Barrage has been entrusted to the Societe Algerienne des Entreprises Leon Chagnaud et Fils, which is the Algerian branch of a famous French firm of contractors who have already carried out several important contracts in France and her colonies. The famous Tunnel du Rove, which connects the open



Sketch showing cross section of dam.

sea at Marseilles with the inland canal system of France, was constructed by his firm. This tunnel is nearly five miles long and is carved out of solid rock.

The Cheliff is a rapid and very variable river. During the summer months there is scarcely more than a trickle of water in the river bed, but in the winter the water rises and falls with abnormal rapidity. A rain storm to the South will cause a rise of as much as 14 feet in four hours, and the floods subside almost as quickly as they rise.

Rock Fill of 817,500 Yards — Height 180 Feet

The projected dam is to consist of a concrete wall 40 feet thick across the valley, which will be constructed to a height of 45 feet above the river bed. Behind this wall 625,000 cubic metres (817,500 cubic yards) of rock are to be stacked to a height of 180 feet, this being the total ultimate height of the dam. The accompanying sketch will give an idea of the form which the Barrage will take.

In order to cope with, and divert, the river while the construction of the dam is in progress, a tunnel is being driven through the bank and a concrete gallery has been constructed alongside the bank. When the dam is completed the tunnel will be blocked up and the gallery will be utilized to control the stored-up water. In all, 18,000 cubic metres (23,544 cubic yards) of concrete will be used in the construction of the gallery and tunnel.

Considerable excavation has been carried out at the base of the dam, and for this purpose the contractor purchased a D-2 Bucyrus-Erie Diesel shovel which has been in operation since April and has given lively satisfaction to all concerned. When wagons are available outputs of 60 cubic yards per hour are comfortably maintained.

Bucyrus-Erie D-2 Diesel excavating in front of diversion tunnel.

Rock Fill and Aggregate from Quarry Five Miles Away

All the rock and stone for use in concrete making and for the rock fill has to be transported five miles by rail from the nearest place where suitable stone could be found. A Bucyrus-Erie 50 - B Ward - Leonard electric shovel has recently been installed at

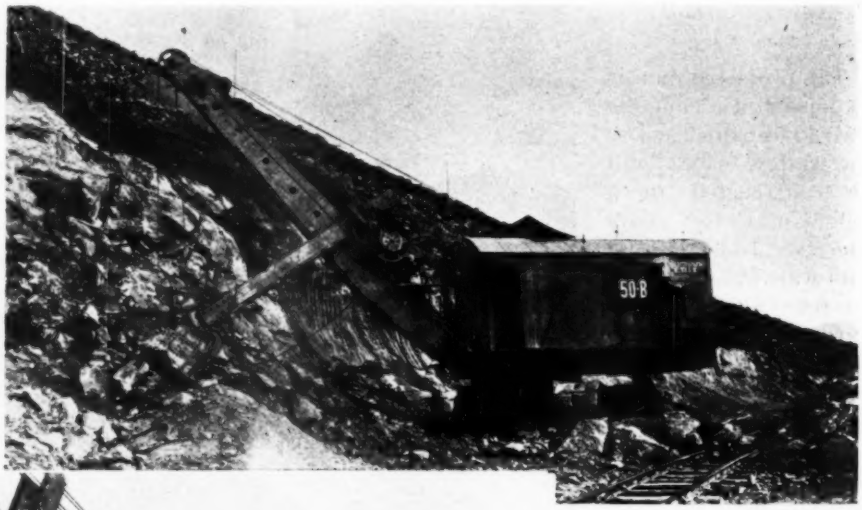
General view of excavation for by-pass canal.

the quarry, and is at present engaged in sorting rock and stripping the rock deposits. In due course this shovel will dig and load the blocks of limestone for the rock fill. An up-to-date stone crushing plant, with a capacity of 55 cubic yards per hour, supplies the crushed stone and sand necessary for a concrete mixer of similar capacity. The concrete mixer has been installed immediately above the barrage, and the concrete flows by gravity to the foot of a tower, where it is hoisted by electricity to a suitable height and allowed to flow by gravity through troughs into place.

On the opposite side of the river to the tunnel a by-pass canal is being excavated, which will entail removal of 530,000 cubic yards of earth. The digging is very tough, a considerable amount being sandstone. A second Bucyrus-Erie 50-B Ward-Leonard electric shovel is now actively engaged on this excavation and is getting outputs of 130 cubic yards per hour, loading in 4-cubic-yard trucks. The by-pass canal is to be 330 feet wide at its mouth, tapering down to 130 feet at its outlet, and will allow a flow of 2,000 cubic metres of water per second.

Reservoir to Form Lake Twelve Miles Long

When completed, the Barrage will form a lake 12 miles long, and will hold up three hundred million cubic metres (79,251,000,000 gallons) of water. An enormous amount of preparatory work has been carried out, including the building of a complete village to house the numerous employees. More than 20 miles of railroad track serves the various workshops, machinery dumps, quarry, etc., and considerable courage and determination have been shown by the Directorate in overcoming various difficulties attendant upon such a project in an isolated district.



Excavating in quarry with Bucyrus-Erie 50-B Ward-Leonard control shovel. In the lower view Monsieur Rousseau, Resident Director of Works, is the gentleman third from the left, leaning against 50-B caterpillar-type mounting.

Monsieur Cochard is the Director General for the Algerian branch of Messrs. Leon Chagnaud et Fils, and is in charge of all work being performed in Algeria. Monsieur Rousseau is the Resident Director of Works at the Barrage.

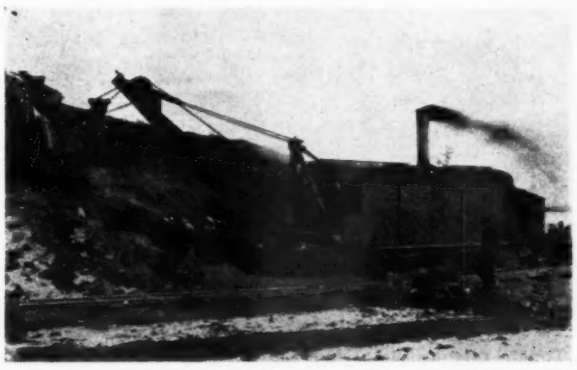
Old Six-Fifty-Three:

still young after moving 4,000,000 cubic yards—a quarter century of service

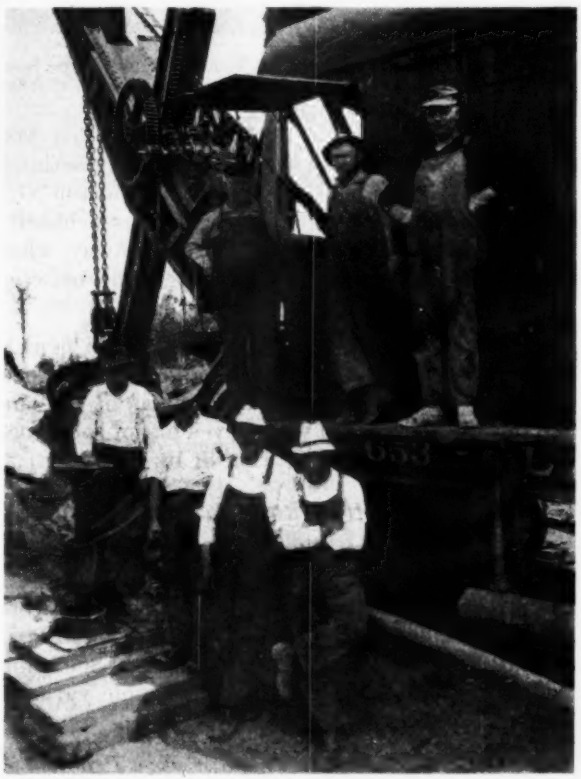
L. A. Bumgardner, of L. A. Bumgardner & Company, well-known St. Paul contractors, attempts to give us here the thoughts of "old six-fifty-three," Bucyrus-Erie railroad type shovel that, for the past twenty-five years, has faithfully served his company and its predecessor, Dale & Bumgardner.

She was 22 years old at the time but you would never know it to look at her.

MY ancestry can be traced back to the prehistoric age when nature placed me in the ground; whence, after years of purification, I was taken to the furnace to be burned and refined to be made into the wonderful machine I have proved myself to be. It was in the year 1905 that the Bucyrus Company gave me birth by putting me through all the stages for my life's journey and work, which in my case was for the firm of Dale & Bumgardner, St. Paul, Minnesota. I landed in Minneapolis, on a bright spring morning twenty-five years ago, ready to remove the overburden of earth from a big stone quarry. I was young then, and believe me, as I looked at the immense amount of material before me, I wondered if I would be equal to the task, but knowing my makers and realizing that they had a reputation at stake, I took a long breath and decided that I would give the best in me, so I went to work. My new owners were kind to me and furnished the best feed and water and skilled runners and



Youngster only five years old back in 1910.



Here is the gang that put the 653 through her paces in 1927.

care, so I just had to show my appreciation, and I did. The work was completed in the course of a few months without a hitch of any kind, and I guess I made the contractors some money for they were all smiles. After this work was done I was

(Continued on page 239.)

Another Link Added to *New York-Boston Highway*

▲ ▲ ▲

Portland-Cobalt project finished in record time by D. Arrigoni, in spite of hard going.

▲ ▲ ▲

Beautiful scenery along this Connecticut section of the Boston-New York highway will add to the pleasure of travelers on the new highway.

AMONG the large road jobs completed last year in Connecticut was the Portland-Cobalt project on the new Boston-New York highway through Southern Massachusetts and Northern Connecticut. This highway when completed will decrease travelling time between the two cities about an hour.

The section completed by the Arrigoni firm is sometimes called the "Scenic Highway of Connecticut" as it affords magnificent vistas of the surrounding country and was carved out of solid rock ledge through a great portion of its length.

Almost Half Rock Excavation

Building this section of 19,570 feet of the road, concrete paved with 7-inch slab 20 feet in width, involved over 200,000 cubic yards of shovel work which included 92,333 cubic yards of rock excavation, 91,751 cubic yards of common, 14,800 cubic yards of earth borrow and 32,000 cubic yards of gravel borrow.

Getting Started on One of Cuts a Problem

The excavation was handled by two Bucyrus-Erie Type B-2 steam shovels and one Bucyrus-Erie 41-B steamer. Practically all of the rock excavation was handled by the latter.

An interesting feature of the job was the handling of one of the cuts illustrated on our cover and accompanying illustrations. Notching through this rock hump was required, and all the material was planned to go into the adjoining gully. It was impossible to start from the open end with the cut and haul over the knob with the dirt. Neither was there any practical way to approach across the gully. It was a nice profitable piece of short haul rock cut if you could get started on the grade next to the gully but the difficulty lay in getting started.

The D. Arrigoni outfit scratched their heads a bit and took another look over the ground.

Tough digging here and no mistake, but the 1¼-yard Bucyrus-Erie steamer kept the Macks stepping lively and the flag at her boom point flying.

This was clear sailing after the Bucyrus-Erie 41-B climbed over the knob and lowered the Macks on to the new made grade.

Shovel Climbed Over Rock Knob

They figured that while their Bucyrus-Erie 41-B didn't look much like a mountain goat, she could climb over the knob alright, nevertheless. And climb over she did. It didn't take long for her to cut in on the ravine side casting out the blasted rock 'till she'd worked herself down to grade.

When she couldn't reach to cast any more, one of the Mack trucks was moved in over the rough mountain trail the 41-B had made to get in, and was lifted down to the new grade by the shovel. As soon as there was room to work two trucks another Mack climbed the ridge and was lowered to the smooth footing of the grade in the same way. From then on there was nothing to it except the steady chug chug of the shovel, the dull thud of the blasts and the merry banging of rocks crashing down into the ravine.

Job Finished Ahead of Schedule

Dionigi Arrigoni, head of the firm of D. Arrigoni, was away most of the time, and while the planning of equipment and laying out of the job was worked out with his assistance, the details and pushing through of the job was handled by his son, Charles.

And a good "pusher" Charlie proved to be, for the job was finished in five months — well ahead of schedule.

Transportation Division Co-operating with War Department on Waterways Survey

Arrangements have been consummated for co-operation in the study of the economics of inland waterways transportation between the Transportation Division of the Bureau of Foreign and Domestic Commerce and the War Department, which is expected to hasten progress materially. The Transportation Division has been working for some time on the subject, covering in its field work the Mississippi and Illinois waterways and the Warrior and Ohio Rivers. Potential traffic surveys also have been made of the Missouri, Mississippi, Ohio, and Warrior Rivers. The War Department's studies have involved the economics of certain river improvements.

The plan for co-operation between the two Departments has as its aim the determination of economic and engineering facts needed in connection with the comprehensive plan of inland waterways development favored by President Hoover.

The Commerce Department plans to appoint in the near future an advisory committee representing all sections of the country, to aid in securing authoritative data on the subject.

Dynamite Digs Swamp Ditches

Bob Massey, construction foreman.

REPRODUCED here is a most interesting collection of snapshots showing ditch blasting through swampy country, recently sent us by John P. Matthews of the Utilities Construction Company.

They were taken on one of the Utilities Construction Company jobs consisting of draining 600 acres of swamp land for the Justin Matthews Company in a subdivision of North Little Rock, Arkansas, known as Meadow Gardens. A lake here had previously been drained to reclaim the area, but the main ditch was not large enough and the land flooded with almost every rain.

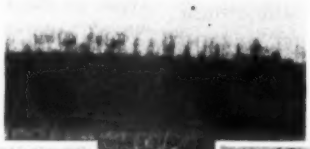
Occasionally the shots failed to propagate. Here's one where the loaded shot failed to set off the line. However, another load did the trick.

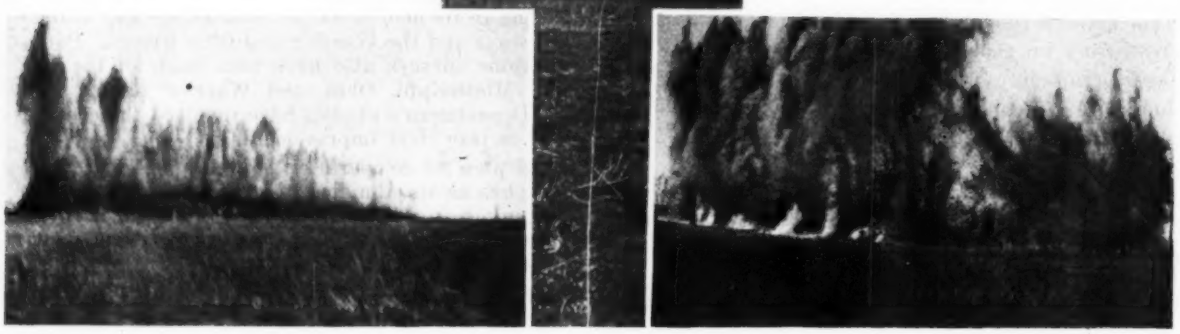
The old main ditch was increased to about three times its former size with a dragline. This canal is between two and three miles long and leads to the Arkansas River. Smaller ditches were blasted to connect with the main by propagating shots as shown in the illustrations.

Ditching with dynamite is, of course, a stunt that most dirt movers are familiar with. For the smaller-sized ditch it is a simple, fast and easy method that opens a neat ditch, requiring no hand finishing if the work is properly handled. It also eliminates the spoil pile along the side of the completed ditch. Dynamite is not practical, however, in loose sand, gravel or in hard-packed dry earth.

Propagation, or detonating a row of shots from a single primer in a central hole, is only practical in wet soils where holes two feet deep will stand half full of water. It is necessary to use 50 to 60 per cent straight dynamite, as other grades are too insensitive to be detonated by the shock from a single load. Increased charges should be used under stumps and boulders, of course, and the method may be practiced in the roughest of swamps, even when the surface is covered with several inches of water. The best way to arrive at proper loads, depth and spacing is by trying some experimental shots of about 10 holes each, as soil and water conditions vary the effectiveness of the explosive. Two or three test shots will give you the right answer. For 18-inch spacing, using one cartridge to a hole, it requires 880 pounds of dynamite to dig one-half mile of ditch.

Completed ditch after blasting.



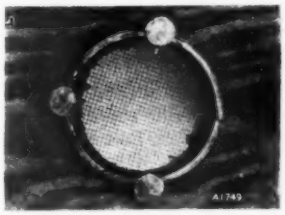


Left: A shot 360 feet long. Center: Loading a ditch preparatory to shot. Right: Propagating a ditch around a right-angle curve in order to reach a very low place.

FIELD NOTES

Removable Strainer Screen

A quite simple and practical way of applying a commonly used, but in this case removable, strainer screen is shown above. Three large-headed tacks or nails are driven into the wood near the hole so as to compress an old gas engine cylinder ring, and with just enough room below the heads of the nails for the ring and strainer or screen. The ring when shoved in and compressed firmly, holds the strainer down, though it is easily pulled out so the strainer can be taken up for cleaning or renewal. Much more convenient and handy than the usual way of tacking down such small screens or strainers in place. You generally spoil nails, screen and the wood around the hole when taking them up. The more snap or spring there is in the old cylinder packing ring, the more securely the strainer will be held down. — FRANK W. BENTLEY, JR.



How to Remove Scale from Inner Radiator Surfaces of Tractors

The presence of scale on the inner surfaces of tractor radiators is decidedly detrimental to the efficient circulation of water in the cooling system.

One method of removing scale from the inner surface of the radiator is by the use of hot water in which a small amount of ordinary washing or baking soda (about one teacupful to each two gallons) has been dissolved. Fill the radiator with this solution and then start the engine, running same with the spark retarded for about 15 or 20 minutes until the solution becomes hot and has thoroughly circulated through the entire cooling system. Next, drain off the solution and thoroughly flush the system with clean water, using a hose for the purpose. Do not permit the soda solution to remain in the radiator for more than an hour. Where water known to contain relatively large amounts of scale-forming ingredients is continually being used in the radiator of the tractor, two or three tablespoonfuls of the washing soda may be kept in the cooling system at all times.

For the removal of very hard deposits, ordinary lye may be used in the proportion of one pound to three or four gallons of water. With this mixture in the radiator the engine is run for about 10 minutes, after which the lye is drained off and the cooling system thoroughly cleaned with several fillings of clear water. For the same purpose, muriatic acid may also be used by adding from a pint to a quart of the commercial product to the contents of an ordinary tractor radiator. The engine is then run for about five minutes, the solution drained, and the cooling system flushed with a number of fillings of clear water. — H. L. Kauffman.

Highway Forecasts for 1930

In addition to the very complete highway forecast which *The Excavating Engineer* was pleased to present in January with additional reports in March and April, we can now add the following:

Idaho to Spend $6,000,000

Detailed figures covering Idaho's road program for 1930 are not yet available, but it is expected that a sum of approximately $6,000,000 will be spent for maintenance, construction and betterments. This figure is about 50% in excess of expenditures of previous years. An important item of the season's program will be the resurfacing and oiling of approximately 300 miles of highway.

Australian Unemployment Will Be Relieved by Increased Road Work

Following a conference at Canberra between Federal and State Ministers, a sum of £1,000,000 ($4,866,500) has been made available from the Federal Roads Fund for works to relieve unemployment. Approximately £276,000 ($1,343,154) is to be spent in New South Wales, £180,000 ($875,970) in Victoria, and £192,000 ($934,368) in Western Australia. Arrangements are to be made for work to commence immediately. The money is to be spent on roads of the class defined by the Federal Aid Roads Agreement — namely, roads of a national character.

These Federal funds will be in addition to state and local expenditures which are of considerable proportions. For instance: In 1929 the Main Roads Board of New South Wales spent approximately £12,000,000 ($58,398,000) on roads, principally on highway construction and improvements. The country Roads Board of Victoria spent £2,080,724, ($10,125,843) during 1929. In addition to the amounts spent on road construction, £509,776, ($2,480,725) was spent on maintenance of 5,552 miles of roads.

Road Building in the Philippines

At the end of the calendar year 1929, in the Philippine Islands there were 6,760 kilometers (4,200 miles) of first-class highway, 3,630 kilometers (2,256 miles) of second-class highway and 2,250 kilometers (1,398 miles) of third-class highway, making a total of 12,640 kilometers (7,854 miles) of roads in an area of approximately 114,000 square miles. In 1910 the total length of roads was only 5,599 kilometers (3,479 miles). In addition to these roads there is a fairly well-developed system of trails leading to these other arteries of transportation. On these trails one may still see merchandise being transported to and from remote villages on the backs of men. At the end of 1929 there were 17,031 permanent bridges and culverts throughout the Islands which have greatly increased the effectiveness of provincial highways. In 1929 the expenditure for road building in the Philippines was $7,839,500.

Alberta

The Province of Alberta, of which Hon. O. L. McPherson is Minister of Public Works, Edmonton, Alta. announced 1930 road program totalling $5,550,000, including construction, maintenance of existing highways, bridges, ferries, etc. The main items are as follows:

Main highways construction	$2,000,000
Main highways maintenance	960,000
District highways construction	750,000
District and city road maintenance	500,000
Secondary highways construction	150,000
New bridges	750,000
Maintenance bridges	60,000
Ferries	80,000

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The Business Situation

IF WE ARE to take the construction industry as one of the most important business indicators we most certainly have reason to feel optimistic at the present time. Last August, construction activity fell off rapidly; decrease in business activity and the stock market crash did not come until sometime later. Now we see construction forging ahead very rapidly. To be sure activity is still under that of a year ago, but some of the weeks in March, 1930, showed even a higher rate of activity than in March 1929. In fact, according to F. W. Dodge Corporation, March was the largest month since August, 1929, and March contracts for building and engineering projects in the 37 States east of the Rocky Mountains reached a total of $459,119,000. The monthly total registered the full seasonal increase of 45 per cent over February of this year, and it was only 5 per cent under March, 1929. Contracts in December, 1929, were 27 per cent under December, 1928; each succeeding month of this year has lessened the spread between current contract volume and that of a year ago. This year's first quarter contract total has amounted to $1,100,147,200, being approximately 12 per cent behind the corresponding period of 1929.

As in the case of the two preceding months, March awards for the construction of public works and utilities, totaling $105,349,800, led all other types at 23 per cent of the total. Contracts let for residential buildings amounted to $101,491,600 or 22 per cent of the aggregate; awards for commercial structures totaled $80,001,500 or 17 per cent; and lettings for industrial construction amounted to $74,332,600 or 16 per cent.

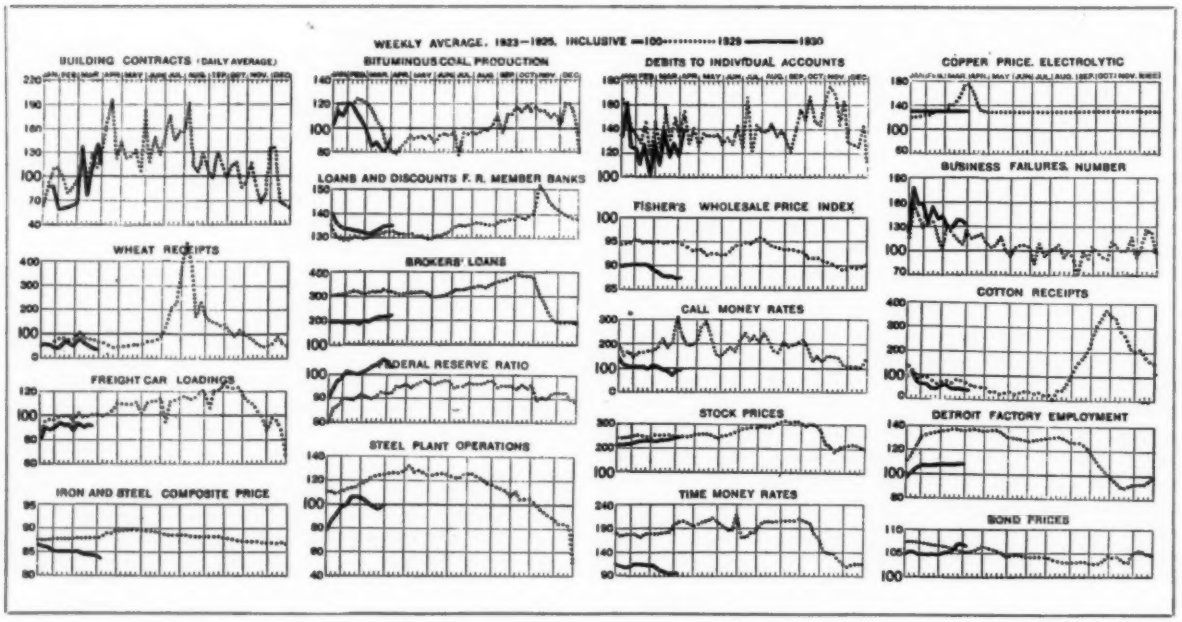
Contemplated new work of all kinds reported in March amounted to $732,735,900, compared with $780,209,400 reported in February, and $886,075,100 in March of last year.

Business in general has shown seasonal improvement, and the steel industry, although showing a drop during the first part of March in the percentage of capacity operation, reached a stable point about the fourth week in March and showed an increase at the last of March. United States Steel Corporation's orders on hand have shown a slight gain each month of this year.

One of the most assuring factors in the present situation is low money rates. Call money rates are down to the weekly average of 1923 to 1925 inclusive. The Federal Reserve rediscount rate is at a point lower than it has been since the first quarter of 1928. Obviously this easy money removes one of the difficulties of last year — the lack of ample funds at reasonable rates for business purposes.

American portland cement mills show some improvement during the past month in the ratio of operations to capacity as indicated by the figures for

WEEKLY BUSINESS INDICATORS



12 months' period ending March 31st. According to statistics by the Bureau of Mines of the Department of Commerce, the ratio of operations to capacity for the last 12 months' period was 66.1 per cent. This ratio for the 12 months' period ending February 28 was 65.6 per cent. However, the ratio percentage for the 12 months' period ending March 31, 1929, was 70.9 per cent.

During the month 11,225,000 barrels were produced, 8,846,000 barrels were shipped, and stocks on hand at the end of the month were 30,563,000 barrels. Production in March, 1930, was 12.6 per cent more and shipments 12.5 per cent less than March, 1929. Stocks at the mills were 2.8 per cent more than a year ago.

You will notice that stock prices have climbed back to approximately where they were in April 1929. It is not unreasonable to expect that this increase in stock market prices has been somewhat too rapid and may be followed by a reaction. If such proves to be the case we should bear in mind that it is purely a readjustment of the stock market and not an indicator of future business.

Old Six-Fifty-Three

(Continued from page 233.)

loaded up and started travels that has taken me into many many states, on railroad work, government and state work, digging up and loading more than four million yards of all kinds of material, little thinking then that, after twenty-five years, I would be as ready to go as I was on that first morning in 1905. I ascribe my long life and service to the care that my makers gave me when they saw to it that the very best material was used when they made me, every part fitted exactly to the other part, making a perfect whole. During all these years, the only vacation I have ever had was last year, not because I needed it, but because the work on hand was not fitted to my old-fashioned style, but I was ready to go if called on to do so. The only trouble with me is my memory, which at this time cannot recall the details of my many activities through the years. Suffice to say they have been interesting years, and I feel that when I am again called upon I will be ready to go.

An old "girl" am I who has flirted around,
And dug up the rock, and dug up the ground;
For twenty-five years I've been up on my toes,
I care not what job, nor through what it goes.

Age has not hurt me, nor years that have gone,
I'm as ready to work as the day I was born;
Believe it or not, bring the moderns to me,
I'll show them my heels, "I'm old six fifty three."

A traveler in the south returns with a tale of a sign he saw on the only restaurant in a small town. It said boldly "Eat Here Stranger or We Both Starve."

Charles Ffolliott

In the death of Charles Ffolliott, pioneer contractor of the Great Northwest, the world has lost a great organizer and a skilled builder — our industry has lost one of the ablest of leaders.

Mr. Ffolliott was born in Dublin in 1852 and received his early education there, emigrating to Canada in 1881. Six years later he moved to St. Paul, where he became associated with the D. C. Shepard organization. He joined the old firm of Foley Bros. & Guthrie in 1888. In 1896 Archibald Guthrie and Charles Ffolliott withdrew from the above company to form A. Guthrie & Company, being later joined by H. L. Mundy.

For seventeen years after the formation of this company Mr. Ffolliott had personal charge of their operations, and was actively identified with a large portion of the railway development of the Northwest. During these seventeen years A. Guthrie & Company constructed in the neighborhood of twenty-five hundred miles of roadbed for the Great Northern, Northern Pacific and the Burlington railways. After the death of Mr. Guthrie in 1913, Mr. Ffolliott and Mr. Mundy continued the organization as A. Guthrie & Co., Inc. Mr. Ffolliott served this company as president from 1913 to 1923, and from that date until his death was Chairman of the Board of Directors.

Under his direction, A. Guthrie & Co., Inc., earned a place among the greatest of American contractors. Today from coast to coast projects they have built serve mankind. Increasingly varied has become the character of these works; they include all types of railway and highway construction, bridges, dams, tunnels, canals, besides stripping and mining of iron ore.

Mr. Ffolliott was one of the organizers of the Associated General Contractors of America and President of the Northwest Branch in 1921. In company with other men of vision in the contracting profession he gave liberally of his time and energy to advance those movements designed to improve conditions within the industry.

Clay Has Many Odd Uses

In addition to the well-known, widespread uses of clay in the manufacture of brick, pipe, tile, refractories and pottery, it has numerous odd uses, according to Paul M. Tyler in a report recently published by the United States Bureau of Mines, Department of Commerce. Clay, says Mr. Tyler, is used in the manufacture of ink bottles, scouring soap, umbrella stands and insecticides. It is used in the softening of water and the adulteration of food. The urchins who signalize the opening of spring by playing marbles are boosting the clay industry, while Milady at her dressing table frequently uses cosmetics in which clay is a factor. Clay is often used as a filler for paint and paper. It enters into the manufacture of crayons, toilet and tooth powders and packing for horses' feet. The smoker contributes to the clay industry by the considerable use of pipes made of clay. Artists use clay in modeling and taxidermists find use for the material. Clay is used in the filling of cloth and the filtering of oil. It is used also in such varied materials as plaster, alum, foot rules, electrical porcelain, emery wheels, chemical apparatus, condensing worms, battery cups, pumps and pump wheels.

Fresno Contractor Uses Shovel as Jack-of-all-trades

SHOVEL manufacturer's catalogues make a point of the ready convertibility of small shovel equipment. They offer you a shovel boom with dipper handle and dipper for using the machine as a shovel, and a different type of boom for you when in need of a crane, clamshell or dragline. The considerable expense of having two machines is thereby saved for the smaller contractor. You loosen a bolt or two, drop out the dipper handles, lower the shovel boom, hitch on the crane-clamshell boom, hitch up a rope or two, hook on the clam and away you go. Simple as the one-man top for autos much-talked-of a few years ago.

Clamshell-shovel.

But out in hustling California they sometimes haven't time to do things in even this one-two-three fashion. Besides you don't always have a crane-clamshell boom handy just when you want it — even if you own one.

Shovel-crane.

The illustrations show how Stewart & Nuss, Inc., of Fresno do the trick under the latter circumstances. The job was on the corner of Van Ness Boulevard and Calaveras Avenue where they were working on the erection of one of the up-to-date palatial super-service stations. Part of the job consisted of excavating for and placing a 50,000-gallon gasoline tank. No clamshell or crane was readily available for the job, but Stewart & Nuss had their Bucyrus-Erie 1030 ¾-yard gasoline shovel on the job and quickly improvised this for the needed service. The dipper and handles were dropped, a clamshell bucket hooked up, and it didn't take the 1030 long to clean out the hole. After the excavation was completed the clam bucket was set aside and the machine used as a crane. A special wire rope sling was wrapped around the tank and attached to the hoist rope of the shovel-crane.

"Up" signaled the "hook" and up she came with ease.

"Over" he waggled and over she went.

"That'll do," came the signal as she hovered over the hole.

"Lower away," said thumbs down and gently she drifted down into the yawning hole to lie snug on her new-made nest.

"And that's that," chuckled the contractor as he endorsed his check, proving again that necessity is the mother of invention and that the wide-awake contractor of today is always quick to grasp the opportunity of using his excavating machinery to best advantage.

CRAWLER WHEELS
That Stand the Gaff

1. Built for heavy-duty service to provide a wide margin of safety over their rated load capacity.
2. The wheels are extra large in diameter, which contributes to their easy running.
3. Will not choke up with sand or mud as do most other tracks.
4. Take-up provided for adjusting slack.
5. Shoes fitted with bushings and pins reversible for wear.
6. Wheels equipped with Timken Roller Bearings to take care of thrust as well as radial loads.
7. Track tension members are sturdy alloy steel forgings, heat-treated. Built to stand the gaff.
8. Trackson Crawler Wheels are designed and built by crawler specialists.

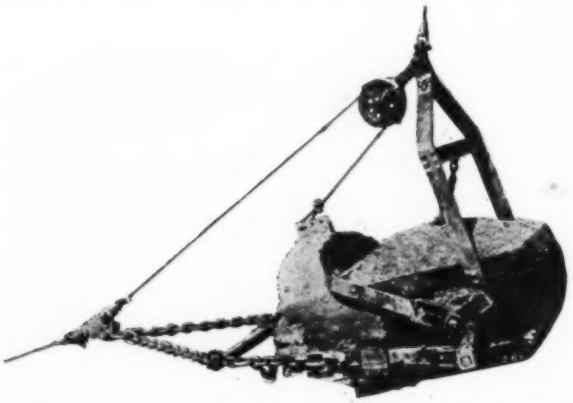
TRACKSON Crawler Wheels are built to render the kind of service you expect and pay for. Users say that Tracksons pull easier, last longer and cost less to operate and maintain. They are built right in every detail. In shoe-pin construction, in frame construction, in wheel and bearing construction, and in materials, Trackson Crawler Wheels embody the newest and best engineering practice. Let us send you full particulars without obligation. Write today and let us know the make and size of wagons you are using.

Trackson Company
MILWAUKEE WISCONSIN

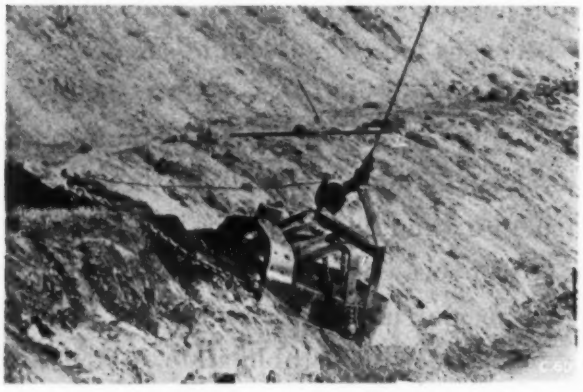
EQUIPMENT YOU OUGHT TO KNOW ABOUT

Patented Automatic Door for Dragline Bucket

A new device for keeping the full load in the dragline bucket has been placed on the market by the *Bucyrus-Erie Company, South Milwaukee, Wisconsin,* for handling free running materials, such as sand,



gravel, sandy loam, loose dirt and very wet earth, as shown in the upper illustration, the full load is held in the bucket by the pull of the hoist. When the hoist bail is slacked as in digging, the pull of the drag rope holds the door open, as the lower illustration shows. The operation is entirely automatic, and, according to the manufacturers, much less drag rope effort will be necessary than is ordinarily used to keep the bucket from spilling. This will mean a saving in rope costs, wear and tear on machinery, brakes,



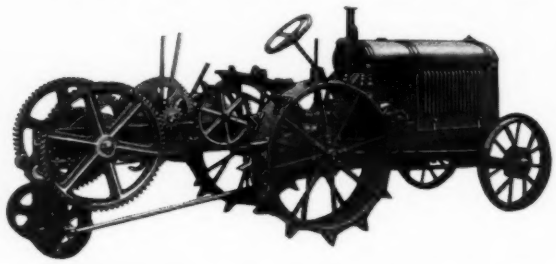
etc., and will permit faster operation of the dragline.

The bucket equipped with this automatic door can be hoisted the moment it is filled (after passing boom point) and the full load can be gradually dumped by the gradual opening of the door if desired. Because the load can be hoisted quicker, less dirt will be carried by the ropes into the machinery. The automatic door attachment is especially adaptable to excavating gravel or other free running material from under water, but may be quickly removed for the digging of rock, stumps, hard clay, etc. The device can be applied to practically any dragline bucket in use today, and for further information write the manufacturers. Please mention *The Excavating Engineer.*

Handy Stump Puller Tractor Unit

A recent announcement of *Dorsey Brothers, Elba, Alabama,* brought to the attention of contractors and road builders of the manufacture of a full-portable stump puller of unusual power.

The Dorsey Model "B," shown above with McCormick-Deering tractor, will develop a pull of 360,000 pounds when used with three pulleys. On a direct pull, using one take-up, a pull of 90,000 pounds — the tensile strength of inch cable — is exerted. The unit may be attached or detached from the tractor in a minute, and for clearing right-of-ways where frequent



moving is necessary, only a minimum loss of time is required. The manufacturers say of this unit, on which they have experienced a nice volume of sales, "the full-portable feature, a design so important and widely recognized, combined with a tremendous developing power and simplicity of operation, insures maximum performance independent of the work to be performed."

An illustrated catalog has been prepared on Dorsey Stump Pulling and Skidding Equipment, which will be sent upon request. Use a card, bound in the center of this magazine.

A New Type of Explosive

The Hercules Powder Company, Wilmington, Delaware, is now marketing a new type of explosive named Gelamite. The new explosive combines the safety and economy features of the high-ammonia content dynamites with the more water-resistant characteristics of gelatin, while at the same time it is semi-plastic and easy to handle. Gelamite is calculated to serve as an all-around useful explosive which will greatly reduce blasting costs. It will be produced in three strengths, replacing the old-style gelatins and extra gelatins of 30 per cent to 60 per cent strength.

Circumstances Alter Cases

"At the student council last Saturday night my suspenders broke right in the middle of the floor."

"And weren't you embarrassed nearly to death?"

"Well, not very. My roommate had them on."

SHOTS FROM THE FIRING LINE

Honor Portland Cement Association for Effective Safety Program

A remarkable safety effort, in which practically an entire major industry employing many thousands of workers is participating, was recognized at the recent meeting of the Joseph A. Holmes Safety Association in Washington, D. C. when a certificate of honor was awarded to the Portland Cement Association for its excellent work in the course of a campaign against lost-time accidents. In awarding the certificate, it was pointed out that since 1924, the year in which the campaign was started by the Association, an average of 10 plants out of an average total of 128 in the industry, have operated throughout the year without a lost-time accident, culminating in the splendid record of 1929 when 28 out of 153 plants, or approximately one plant in every five, went through the year without a lost-time accident.

The Lehigh Portland Cement Company was awarded a certificate of honor for its excellent safety work and safety record. At least one plant of this company has completed the entire calendar year without a lost-time accident every year except one since and including 1924. In 1928 five Lehigh plants had no lost-time accidents and in 1929 four plants had this excellent record. The company's Iola, Kansas, plant has not had a lost-time accident to any of its more than 200 employees since September 10, 1926, or for nearly 3½ years; and its Ormrod, Pennsylvania, No. 3 plant has now gone more than 2 years without a lost-time accident.

American Road Builders Association to Hold Annual Meeting

The annual meeting of the American Road Builders Association will be held Thursday, May 15th, at the offices of the association, 814 National Press Building, Washington, D. C. The officers and directors elected at the recent convention in Atlantic City will be installed at this meeting. Reports of the President, Treasurer, Engineer-Director, Board of Directors and all of the Presidents of the various Divisions will be heard among the business transacted.

The annual President's Dinner of the Association will be held the same evening at the Willard Hotel. Members have been notified that reservations for this dinner must be made on or before May 10th. The City Official's Division and the County Highway Officials' Division will hold their annual meetings Friday morning, May 16th, at the offices of the Association.

Officials of the Association are looking forward to a large and representative gathering of American Road Builders Association members, and each member is urged to attend the various meetings scheduled as well as the President's dinner.

Canada

Quebec Notes

S. Szakos sends us the accompanying snapshot taken in Notre Dame de Graces, Montreal, showing the Bucyrus-Erie B-2 on which he is employed as engineer.

New York Notes

BY R. K. HALL

The following illustration shows a typical scene in the **subway operations of the J. F. Cogan Company,** prominent contractors, of New York. This organization is handling extensive subway operations, and are using two other Bucyrus-Erie 1030 tunnel shovels in their work similar to the unit illustrated above. Superintendent McGonegal of this organization tells of a record made by one of these machines working in an all-timbered subway cut in which it loaded in one eight-hour shift 162 4½-yard trucks and in other shifts exceeded 150 loads. In talking with the officers of J. F. Cogan Company,

who are J. F. Cogan, President, P. H. Cogan, Vice-President and General Manager, and P. J. Cogan, Secretary and Treasurer, we find them all most enthusiastic about the ability of these 1-yard electric machines.

The Carleton Company, Inc., of New York City have four Bucyrus-Erie 1035's working on a subway job which is being constructed under Fulton Street, Brooklyn, New York. They have contracted for 45 blocks of this work and at the present writing their work is half completed. The accompanying illustrations show two of the machines at work on this job. In the upper view one of the 1035's is digging a ramp at Lafayette and Fulton. The lower picture is a flashlight showing one of the 1035's equipped with a 20-foot 6-inch boom and 15-foot handles loading to one of the Macks in a 40-foot heading under the street.

BY T. A. BILLINGS

New York Air Terminals, Inc., are putting the finishing touches on the North Beach airport. About 75 per cent of the excavation on this job was moved with dredge pumps. Cleaning up and grading is being done with two 1030 Bucyrus-Erie gas machines, and two B-2 steams. An old friend, Charles Ruse, is in charge of all equipment.

Owen Buckets

No! It's Not Finicky About the Kind of Job!

Put an Owen Bucket in any kind of material, anywhere, and it's right at home . . . digging in as usual . . . capacity grabs every time . . . frequent overloads. And it stands up under out-of-the-ordinary, severe usage. It will do a bigger day's work *on any job* than any other bucket of the same weight and capacity . . . a guarantee that has been making good ever since Owen Buckets have been in use. No matter what the job or the conditions, if it's bucket work, an Owen will do it better.

THE OWEN BUCKET CO.

6026 **Breakwater Ave.**
Cleveland, Ohio

SHOTS FROM THE FIRING LINE — Continued

Walsh Construction Co. of Davenport, Iowa, is finishing up their work for the New York Central Railroad at New Hamburg, New York. This job had approximately one million yards of excavation, all of which was handled by two 50-B steam, one 41-B steam, one 100-B steam, and one 120-B steam shown above. They expect to start operation very soon on 300,000 yards of excavation on the John D. Rockefeller estate at Tarrytown, New York. This job is about 40 per cent rock and one of the large machines will be used along with a 50-B.

Eastern Notes

BY S. M. CHRISTHILF

We learn with regret that **W. H. Allen** of the W. H. Allen Contracting Company of 609 New York Ave., N. W., Washington, D. C., is very ill. Mr. Allen, who reached the age of 89 on the 29th of March, retired some time ago. We hope that by the time this is printed he will be well on the road to recovery.

Operator W. B. Lindquist of Jessup, Maryland, sends us the accompanying snapshot showing a Bucyrus-Erie B-2 grading on Washington Boulevard between Baltimore and Washington, D. C. Mr. Lindquist tells us that he is in charge of this machine and a Gas + Air on this job, and loaded from 200 to 215 truck loads from each shovel — three dippers to a truck. Contractors Christof and Ensey of Baltimore handled the job with rented shovels. There was considerable rock excavation in the contract.

Pittsburgh and Vicinity

BY J. S. WEAVER

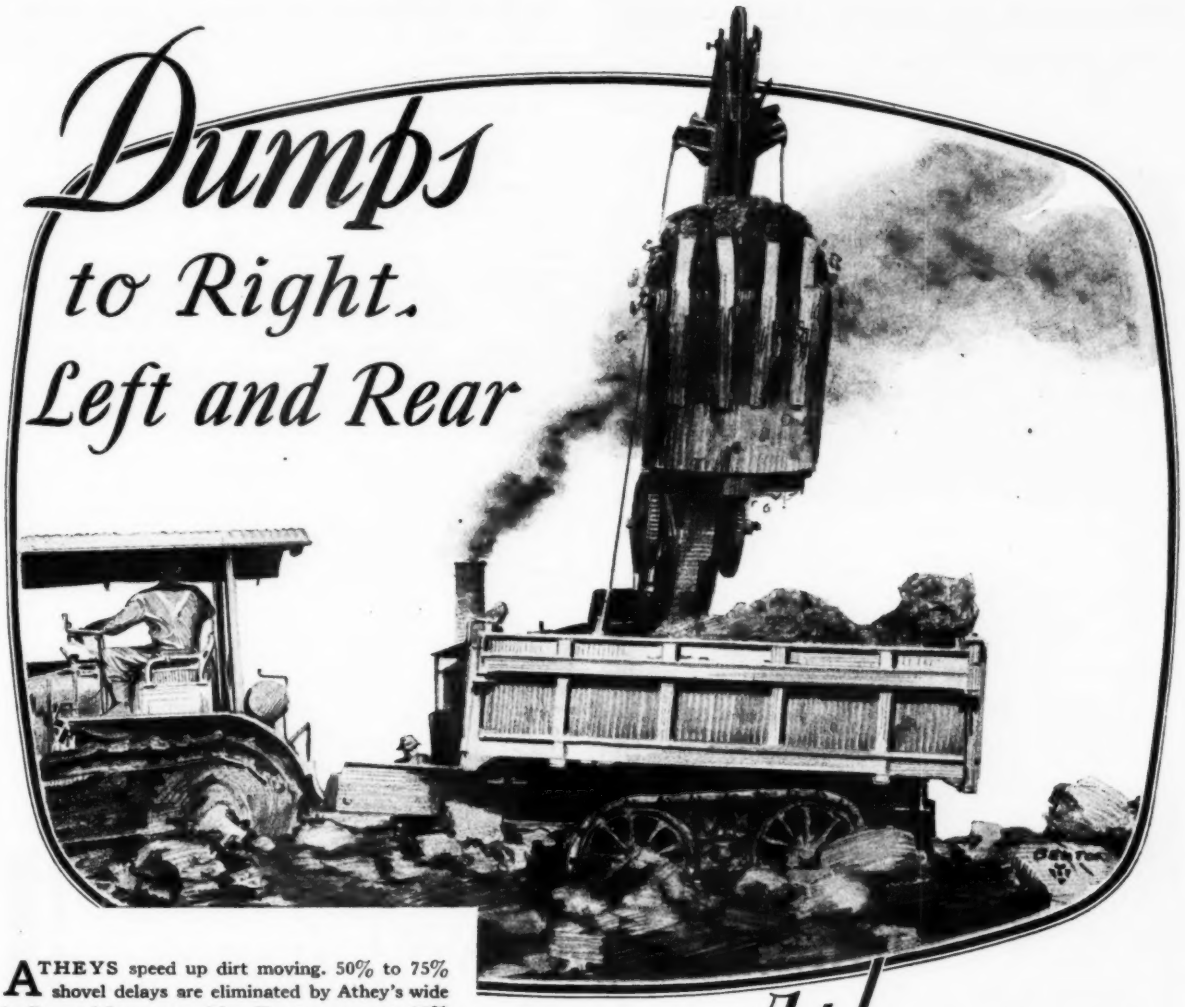
Joseph Gaudy is making good progress with his sewer contract in Forest-Hills Borough.

A. D'Alessandro has started operations on eight miles of sewer in Munhall Borough.

The proposed bridge over Turtle Creek Valley and the Pennsylvania tracks, bids for which are ready to be advertised, has a center arch of 425 feet, the largest reinforced concrete arch in the United States. The bridge is the County's share of a $3,500,000 road-bridge improvement relocating a portion of the Lincoln Highway near East McKeesport Borough line. The State Highway Department will construct the 30-foot wide road of 2.4 miles which will meet the bridge. It will take approximately 70,000 cubic yards of concrete to build it.

In writing to Owen Bucket Co. please use post card bound in the center of this number.

Dumps to Right. Left and Rear



ATHEYS speed up dirt moving. 50% to 75% shovel delays are eliminated by Athey's wide bodies and large capacities. Tractors operate 25% faster with less strain—handle Atheys easier—pull bigger pay loads per trip—make fewer trips per job. Atheys dump to the right, left or rear—fit ALL jobs—dump quickly, cleanly, without time-wasting maneuvering or expensive bull-dozing. Non-miring, they work rain or shine, eliminating costly wet weather operating delays.

Atheys are one-man operated units. They move more dirt with lower costs—more jobs per year—less cost per yard—more profit per job.

Write for complete information.

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3-WAY DUMP TRAILERS

ATHEY TRUSS WHEEL CO.
130 N. Wells St., Chicago, U. S. A.
Cable Address: "Trusswheel, Chicago"
Foreign Representatives:
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ATHEY TRUSS WHEEL WAGON

IT BRIDGES THE SOFT SPOTS

In writing to Athey Truss Wheel Co. please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

Contractors Booth & Flinn have been putting through a grading job on the Ohio River Boulevard in Pittsburgh. The accompanying illustration shows a Caterpillar Sixty with

Euclid 8-yard crawler wagon taking the dirt away from their Osgood.

The T. J. Foley Company will complete Moss Side Boulevard bridge, crossing the Pennsylvania Railroad near Trafford, in record time.

Time for commencing construction of a bridge across the Ohio River at Wellsburg, West Virginia, would be extended a year from May 14th, and the time for completion three years from that date, in a bill introduced in the House by Representative Bachmann of West Virginia.

John F. Casey Company were low bidders on the Allegheny Boulevard. Work has already been started.

The R. H. Cunningham & Sons Company is making very fine progress on their Moss Side Boulevard job. The same company has considerable state highway work under way in Huntingdon County, Pennsylvania.

M. Bennett & Sons, Indiana, Pennsylvania, were low on two Pennsylvania highway jobs at the last letting. Both jobs are in Indiana County.

Freeland, McHale & Patten, Inc., are making the dirt fly on their job at Coraopolis. The loading is done with a Bucyrus-Erie Gas + Air and 31-B. Hauling with Caterpillars and trailer wagons.

Allegheny County will spend about $32,000,000 on road construction this year. Chief among the projects will be the work on the Lincoln Highway, between Turtle Creek and East Pittsburgh, in which the County is to share the greater portion of the expense. The new George Westinghouse Memorial Bridge over Turtle Creek is to be built by the County, and a bridge over Dickson Run is to be built by the State. Cost of the road construction is to be on the State.

Rapid progress is being made on the construction of the sub-structure of the McKees Rocks-Northside bridge across the Ohio River. The Dravo Contracting Company have completed the anchorage pier and abutment on the north bank, while the work on the two shore piers on that side of the stream are rapidly nearing completion in spite of the inclement weather.

Use Something!

Among the slogans submitted in a contest promoted by a manufacturer of cosmetics was the following: "If you don't use our soap, for heaven's sake use our perfume."

A Question of Grammar

"Her niece is rather good looking, eh?"
"Don't say 'knees is,' say 'knees are'."

The new Champions — "the *most powerful diggers* built!"

THE first thing you hear from a user of the new WILLIAMS "Champion" is that *the Digging Power and Speed of this new bucket are beyond anything seen before.*

It's a real champion, that welcomes competition. Put on your job with the guarantee to outdig and outspeed any other bucket.

It will pay you to investigate the 21 improvements that have given the new "Champion" new power and speed. Write for Bulletin "25-D".

G. H. WILLIAMS COMPANY
603 Haybarger Lane, Erie, Pa.
Branch Offices: New York, Pittsburgh, Chicago

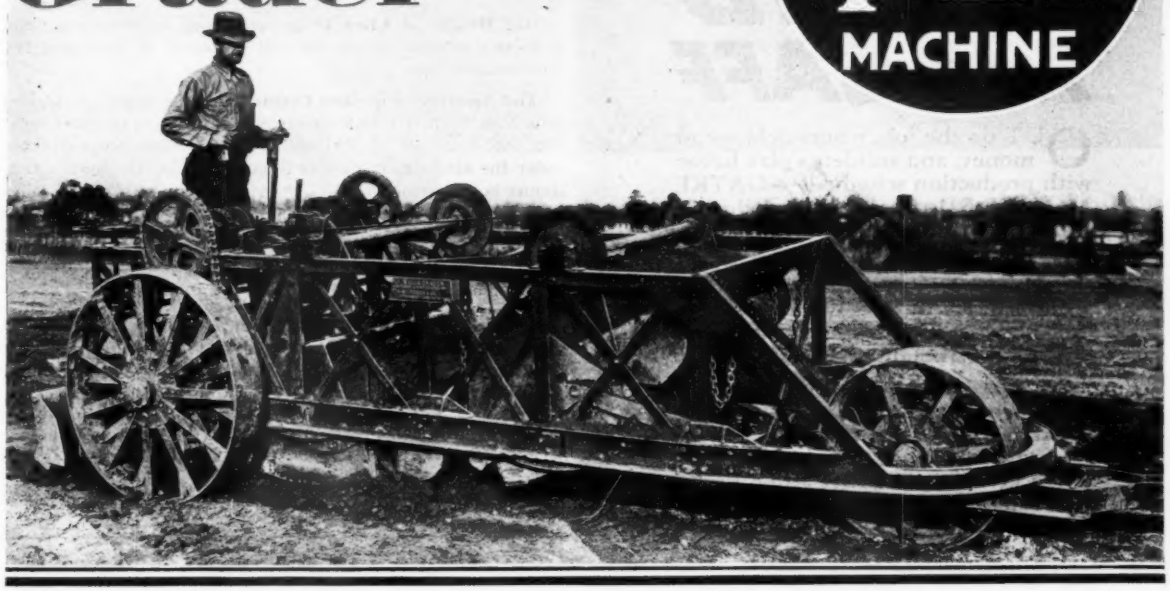
WILLIAMS
FAST-DIGGING BUCKETS

185

In writing to G. H. Williams Company please use post card bound in the center of this number.

The Wagon Grader

5 IN 1 — *dirt moving requirements* — **MACHINE**



The Blaw-Knox Wagon Grader combines all the requirements for dirt moving. It is a self-contained unit.

Economical—contractors in many localities are moving and placing dirt at 8c, 10c, 12c and 14c per cubic yard.

Catalog No. 1210 is a revelation to contractors who want to know how to move dirt quicker and cheaper.

Fill in and mail the coupon

– Digs
– Loads
– Hauls
– Dumps
and
– Spreads

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2018 Farmers Bank Bldg., Pittsburgh, Pa.

Please send me Catalog No. 1210 THE BALL WAGON GRADER.

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GATKE

ASBESGRAPHITE

MOULDED BRAKE AND FRICTION BLOCKS

STAND THE GAFF

OUT on the job, where delays cost money, and accidents play havoc with production schedules — GATKE MOULDED Brake and Friction Blocks are dependable.

Dredges, drag-lines, hoists and steam shovels, — heavy-duty machinery with gigantic tasks to do — work most economically, steadily and safely with GATKE ASBESGRAPHITE Products.

Friction troubles and maintenance costs reduced to a minimum — smooth, even control and easy operation — these are factors that find their highest level in GATKE ASBESGRAPHITE Brake and Friction Blocks. We can supply sizes for all types of equipment.

BUY DIRECT FROM THOMAS L. GATKE
MANUFACTURER

THOMAS L. GATKE,
228 N. La Salle St., Chicago, Ill.
Please send us latest bulletin on
Asbesgraphite Brake and Friction Blocks.

Name_____

Address_____

SHOTS FROM THE FIRING LINE — Continued

Buffalo Notes

BY D. E. WHITE

Vinc Schiavi of Buffalo, recently landed a fine job out of Washington, D. C., to Mt. Vernon. Understand it is one of the best road jobs let in that district in years, and we wish to congratulate Vinc and wish him the best of luck.

Municipal Construction Company of Binghamton recently landed another contract down on Long Island which is going to keep Fred and Don Davis busy for some time. They intend using their three Gas + Airs on this job.

Bill Hewitt of Utica is operating one of these machines. It doesn't look as though we will see much of Fred and Don this summer.

The American Pipe and Construction Company of Amsterdam, New York, are making wonderful progress on their reservoir job just out of Philadelphia at Media, Pennsylvania, under the able supervision of Superintendent Coleman. Andy Manns is operating one Gas + Air, while Tim Murphy is on the other.

Frank G. Hanssell of Buffalo was low bidder on the Cornelius Creek job here at Buffalo. Looks like a fine dragline job and here is hoping he is awarded the contract.

An old friend, Charles Chetwin and Mrs. Chetwin are enjoying a much-needed vacation of several months in Florida. Jim Chetwin is looking after the work. George Brooks is on the Gas + Air while Slim Euston is on the "B".

Barney McCabe of the Hub City Construction Company recently landed a new job. Will see you within the next six weeks, Barney.

JOHNSTON BROS. INC. JOHNSTON FERRYSBURG MICH.

DURABILITY PLUS
in Johnston Boilers

BOILERS which have more than Durability — more than High Quality materials — Efficiency — and Strength — are JOHNSTON Boilers.

Johnston has the user's viewpoint. This is one of the reasons for the popularity of JOHNSTON Boilers the world over.

Sixty-five years of boiler making are behind every Johnston product. No matter what your need is we can build a boiler which will exactly meet that need.

Let us help you with your boiler problem.

JOHNSTON BROTHERS, Inc.
Ferrysburg, Mich.

Earth to be moved in the quickest, cheapest way—trust the engine of the "Caterpillar" Tractor for uninterrupted service! Rainy days, mud or dust to be conquered—trust the wide tracks for ability to keep at work. Incidental jobs, moving boulders, pulling stumps, hauling equipment—trust the flexibility of the "Caterpillar" to keep busy. Street extensions, road widening, highway construction or maintenance—all are jobs for "Caterpillars"!

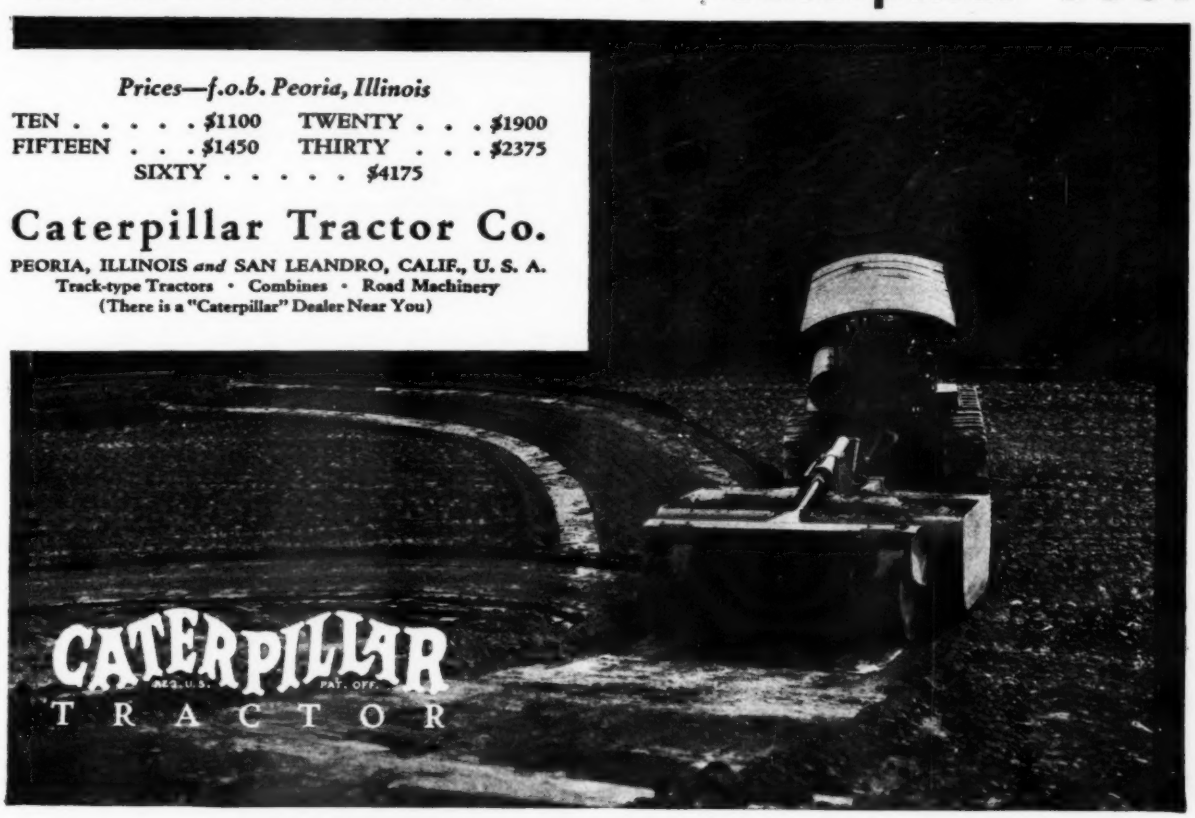
Street Extension . . . a "Caterpillar" Job!

Prices—f.o.b. Peoria, Illinois

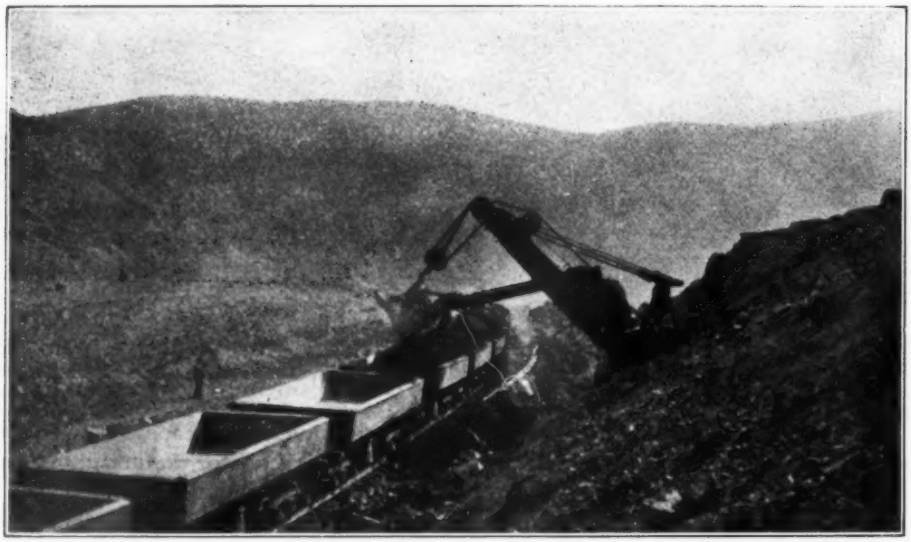
TEN	$1100	TWENTY	$1900
FIFTEEN	$1450	THIRTY	$2375
SIXTY	$4175		

Caterpillar Tractor Co.

PEORIA, ILLINOIS *and* SAN LEANDRO, CALIF., U. S. A.
Track-type Tractors · Combines · Road Machinery
(There is a "Caterpillar" Dealer Near You)



In writing to Caterpillar Tractor Co. please use post card bound in the center of this number.



Loading Western Drop Door Cars, Chino Mines, Santa Rita, New Mexico

Ready for Any Job

At the Chino Mines, Santa Rita, New Mexico, the New Mexico Division of the Great Nevada Consolidated Copper Company, Western drop door dump cars have received enthusiastic endorsement from the company's operating officials. Western cars were installed to reduce the cost of transportation and have been highly successful. The material handled is rock, said to be the hardest known, which makes secondary blasting a major operating problem. The rock breaks into large pieces that are hard to handle and hard on equipment.

The fine record of the Western drop door car at this mine is typical Western service. It is a service founded upon performance, economy, and adaptability to almost any earth, ore, or stone handling job. Whatever open pit mining operations are to be undertaken, there is a Western dump car suited to the task.

WRITE FOR CATALOG 71-K.

Western Wheeled Scraper Company

AURORA, ILLINOIS, U. S. A.

The sturdy Western 20-yard Drop Door Car.

WESTERN

In writing to Western Wheeled Scraper Co. please use post card bound in the center of this number.

The One Machine

for excavating in cramped quarters

WHAT would you use for excavating where you have no room for turntable swing—or in a narrow alley or between trestle bents?

The one logical tool for use in cramped quarters is the continuous digging

HAISS "EXCAVATOR."

On the job pictured, Rawson & Walker, Contractors, cut this underpass through a Chicago railroad embankment where the digging consisted of virgin clay, slag ballast, loose rock, sand, old timber trestle, old piling and 16 to 24 inches of frost. They took out 350 to 450 cu. yds. in eight hours and were backing the trucks in 250 feet. This was one of the first Haiss Excavator jobs and such a wonderful performance we're still telling about it. *Have you read our Bulletin 629?*

GEORGE HAISS MANUFACTURING CO., INC.
144th STREET and PARK AVENUE, NEW YORK, N. Y.
Representatives in Principal Cities

HAISS EXCAVATOR

H-647

In writing to Geo. Haiss Mfg. Co., Inc., please use post card bound in the center of this number.

Speed, Low Maintenance and Mobility
—THAT'S BUCKEYE!

Wheel-Type *Service* Ditcher

In the Buckeye Model 12 Wheel-Type Service Ditcher, rugged construction is combined with compactness and mobility. Its overall width is only 61 inches and it weighs but 6 tons. It eliminates or minimizes costly hand labor in ditching through lawns, between sidewalks and curbs, close to trees, poles and other obstructions. In the open, too, it can be depended upon for maximum results.

This handy little Service Ditcher follows the ditch line accurately, leaving the trench ready for pipe or conduit to follow immediately. It is readily transported by truck or trailer. Five standard cutting widths range from 11½ to 22 inches—maximum cutting depth, 5½ feet.

Write for complete mechanical details.

Model F *Service* Backfiller

This little Buckeye offers remarkable economy in refilling both service and small main trenches. Measuring only 69 inches overall in width (without boom), 7 feet 6 inches in height and weighing but 4 tons, it is easily and quickly maneuvered in close quarters or transported from one job to another. "Back-action" scraper permits operating from the spoil-bank side of the trench. Ask for Model F price and specifications—both will interest you.

The Buckeye Traction Ditcher Co.
FINDLAY, OHIO

There's a Buckeye Sales and Service Office Near You

for over thirty years
Buckeye

SHOTS FROM THE FIRING LINE — Continued

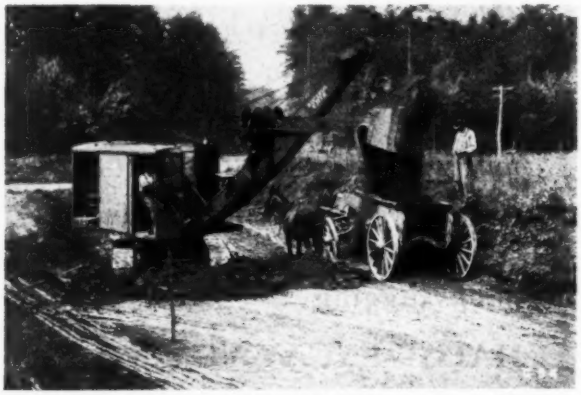
Liberto and Cerullo have a nice road job to start this Spring, and Leo is very busy getting things lined up for a break in the weather, while Mr. Liberto, Sr., and Mr. Cerullo are in Florida.

Our old friend, **Bill Knauer of Attica, New York,** is planning on going to Florida until Spring and has made all arrangements for the overhauling of his Bucyrus-Erie machines, so he will be in great shape to start work when he returns.

Gallagher & Kohler of Tonawanda, New York, have kept their Bucyrus-Erie "B" busy all this winter as a crane and pile-driver on the Buffalo General Electric job.

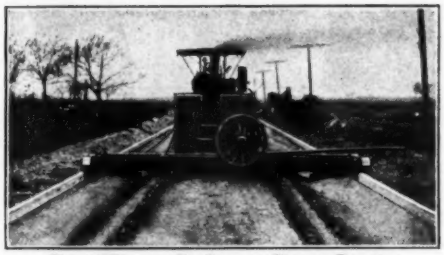
North Carolina Notes

BY J. I. MORAVEC



In Forsyth County, North Carolina, the above Bucyrus-Erie 1020 is busy improving highways. Digging through this

HUG
Subgrading Machines



Cut Your Subgrading Costs

HUG Subgrading Machines reduce your subgrade costs by eliminating guess work in trimming the subgrade to proper specification and consequently saving time and material.

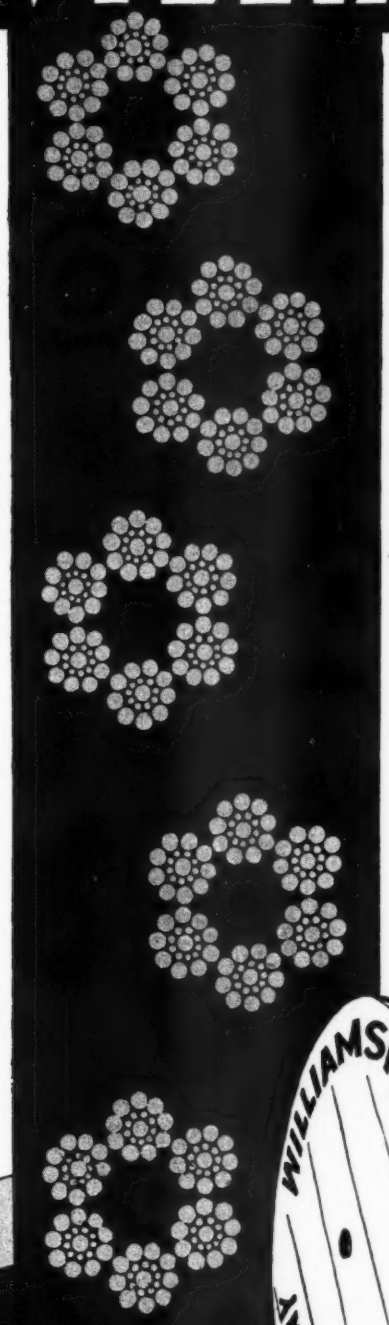
Interchangeable features permit special adjustment for different jobs, and cutting depth and blades are adjustable. Standard width 18 feet. Can be furnished in any desired width up to 23 feet.

Hug Subgrading Machines pay back their cost in the first half mile of operation.

Complete details furnished on request.

THE HUG CO., Highland, Illinois

WILLIAMSPORT



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PROBLEMS TO US

You may not be getting the best service from your Wire Rope for some simple reason that may be easily corrected by our Engineering Staff.

If you are a large user of Wire Rope, 10% or 5% more efficiency will mean a lot to you in dollars and cents at the end of a year.

This service is a part of our daily assistance for the benefit of the Wire Rope industry and it is a pleasure to help you—regardless of the make of rope you are using.

Williamsport Wire Rope is Telfax Tape Marked, which positively indicates in each rope the grade of steel used in its manufacture, a protection of vital importance to users.

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General Sales Offices:
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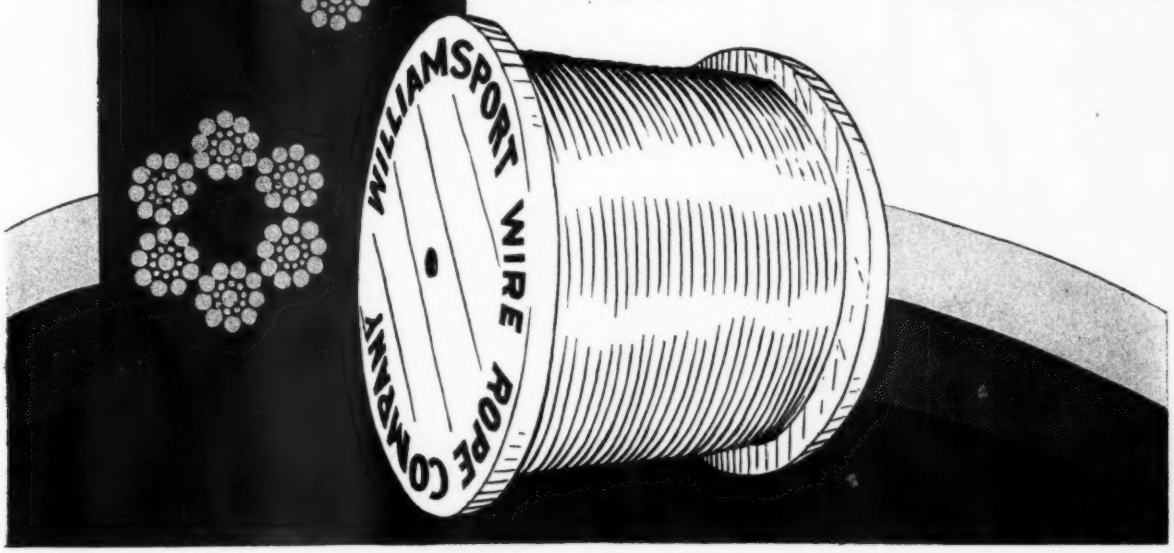

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You know which shovels are the best for your particular line of work. Ask the manufacturers which chain they recommend, and you'll find them strong boosters of TAYLOR-MADE Chain.

For 57 years TAYLOR-MADE Chains have given excavating engineers more service than any other chain money could buy.

Order them from the stock of your local mill supply house.

S. G. TAYLOR CHAIN CO.

P. O. Box 1297-B
HAMMOND, INDIANA

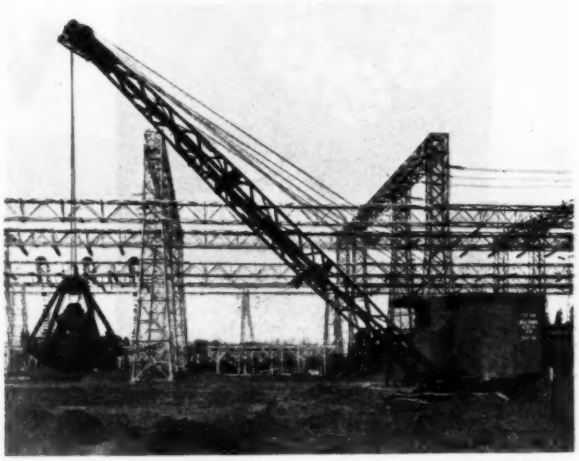
TAYLOR MADE
HAND-ELECTRIC AND MACHINE WELDED CHAIN

SHOTS FROM THE FIRING LINE — Continued

beautiful stretch of woodland proved easy, and the husky ¾-yard gasoline machine had no trouble keeping the mules stepping right along. According to Wm. Schultz who has charge of the operations the 1030 has given very satisfactory service.

Indiana Notes

BY G. WITTE



The Indiana Michigan Electric Company have recently been using their Bucyrus-Erie 1020 clamshell for dirt moving at their South Bend Twin Branch plant. The accompanying illustration shows the machine in action.

INFORMATION—pertaining to the profitable use of Hayward Buckets by many concerns may be obtained by addressing The Hayward Company, 52-54 Church St., New York, N. Y.
Hayward Buckets

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REG. U.S. PAT. OFF.
LUBRICANTS

TAKE THE GRIND OUT OF GEARS—ADD LIFE TO BEARINGS

Demanded by operators whose practical tests cover many years of perfect service in all climates, under the most severe conditions.

Used and recommended by machinery manufacturers, on sound engineering advice and long experience.

Write for our book, "Industrial Lubrication".

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Unit of Union Carbide UCC *and Carbon Corporation*
NIAGARA FALLS, NEW YORK

"HERCULES"

RED-STRAND

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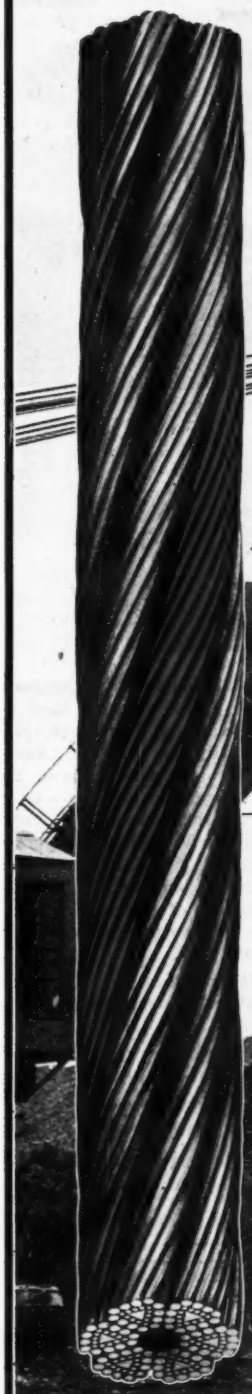
WIRE ROPE



Dependable!

A Wire Rope that Makes for Economy

Dependability in wire rope means increased economy, for a heavy toll is taken every time a replacement is necessary.

"HERCULES" (Red-Strand) Wire Rope is dependable because it is made of acid open-hearth steel wire, and every wire put into it is first rigidly tested by us to make sure it meets our exacting requirements as to strength, toughness, flexibility and wearing qualities.

If you want to increase your daily yardage and at the same time lower your actual operating costs, give "HERCULES" a chance to show you what it can do. Its performance record is continually making and holding friends.

Send for Catalog No. 37

Made Only By **A. Leschen & Sons Rope Co.** *Established 1857*

5909 Kennerly Avenue
ST. LOUIS

New York Chicago Denver San Francisco

Distributors at over 100 different points. The name of our Distributor in any particular locality will be furnished gladly upon request.

THE MEASURE of WIRE-ROPE QUALITY IS THE SERVICE IT HAS RENDERED

Which wire rope to use on your equipment—which brand will give the longest and most economical service—may be best determined by past records of performance established under similar operating conditions. This and the reputation of the maker are of paramount importance.

FOR over half a century American Wire Rope, made exclusively by the American Steel & Wire Company, has demonstrated its superiority—proved beyond question that its tough, flexible and abrasion-resistant nature is the best insurance against breakdowns and costly delays.

Regardless of your particular problem, you will find an American Wire Rope exactly adapted to its economical solution. Consult our nearest branch office or distributor to get the right rope for your purpose.

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STEEL & WIRE COMPANY
WIRE ROPE

AMERICAN STEEL & WIRE COMPANY
SUBSIDIARY UNITED STATES STEEL CORPORATION

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Other Sales Offices: Atlanta Baltimore Birmingham Boston Buffalo Cincinnati Cleveland Dallas Denver Detroit Kansas City Memphis Milwaukee Minneapolis-St. Paul Oklahoma City Philadelphia Pittsburgh Salt Lake City St. Louis Wilkes-Barre Worcester

U. S. Steel Products Co.: San Francisco Los Angeles Portland Seattle Honolulu

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SHOTS FROM THE FIRING LINE — Continued

Iowa Notes

The upper picture shows **Tunnicliff Construction Company**, General Contractors of Davenport, Iowa, erecting steel on the Boiler and Power House, International Harvester Company, Farmall Works, Rock Island, Illinois, with their Bucyrus-Erie 1030 crane. In the foreground may be seen the timber ramp, by means of which they drove the crane up to the first floor level where they erected the balance of the steel. The two lower beams directly behind the boom of the crane are 36-inch Bethlehem beams weighing 207 pounds per foot, or a total weight in each of the four beams of 9600 pounds. In all there was approximately 450 tons of structural steel in this building, all of which Tunnicliff Construction Company handled very nicely with the 1030.

The lower illustration shows the same crane building an intake into the Mississippi River at Bettendorf, Iowa, for the

MEETING PLACE OF CAPITAL AND LABOR

THE KOENIG LABOR AGENCIES

Established 1875

ST. LOUIS
612 Walnut Street
Main 2766 and 2767

KANSAS CITY
501 Delaware Street
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HELP OF ALL KINDS FURNISHED FREE

Allis-Chalmers
Monarch Tractors

Offer the lowest cost drawbar horsepower in their class.

ALLIS-CHALMERS MFG. CO.
Monarch Tractors Division SPRINGFIELD, ILL.

"75" — "50" — "35"

SHOTS FROM THE FIRING LINE — Continued

Bettendorf Company. The Tunnicliff Construction Company used the 1030 to build this intake, consisting of a channel in solid rock approximately 16 feet wide and five feet deep extending from the shore out into the river 1100 feet.

Operator William Hawks, who hails from La Porte City, Iowa, is running a Bucyrus-Erie electric in the quarry of the Dewey Portland Cement Company near Davenport. Bill writes that the machine is up against some hard digging, "but is doing her stuff great . . . . can't be beat."

Texas Notes

BY GEO. A. CARLSON

The Pure Oil Company of Houston, are using their Gas + Air dragline and clamshell for their various construction projects as shown in the accompanying illustration.

Beg Your Pardon

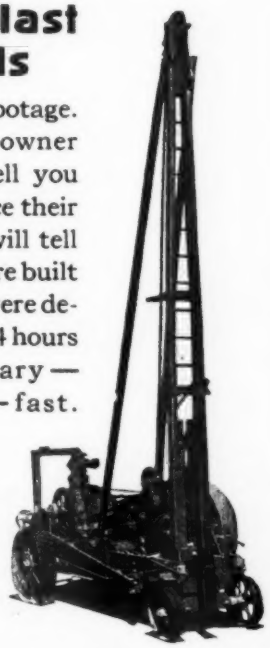
In April we presented two interesting photographs of the **United States Gypsum Company's operations** in their Sweetwater, Texas, quarry showing their Bucyrus-Erie 50-B electric dragline and also their Bucyrus-Erie 1030 electric shovel. Through error the length of the boom on the 50-B was given as 170 feet, and we want to take this opportunity to correct this typographical error. The correct length of the boom is 70 feet and the machine is loading into Easton "Phoenix Side Dump" type cars.

Smart Alec (getting on bus): "Morning, Noah, is your old ark full?"

Driver: "Nope. Only one jackass so far. Come on in."

"Clipper" Blast Hole Drills

give you cheaper footage. Ask any "Clipper" owner you may know to tell you how "Clippers" reduce their drilling costs. They will tell you how "Clippers" are built to stand up under severe demands—on the job 24 hours a day when necessary—rugged and ready—fast.



Either round wheel or crawler type; welded steel or wood frame furnished—all steel machine if specified. Write for full information.

THE LOOMIS MACHINE COMPANY
(Established 1842)
K Street, TIFFIN, OHIO

WORLD NEWS STORIES OF THE KOHLER ELECTRIC PLANT—No. 15

One hundred and ten 2 K. W. 110-volt Kohler Electric Plants ready for shipment to the U. S. Government

guiding the ships of air and sea

THROUGH the night sweeps a powerful beam over land and sea, signalling safety to navigators of air and water. Confident eyes watch for these lights from the cockpits of mail planes; officers on the bridges of liners, freighters and private craft check and set their courses. Power from Kohler Electric Plants operates hundreds of these beacons and these lighthouses.

Over 1000 Kohler Electric Plants are in use by various departments of the U. S. Government. Of the latest shipment of 110, one hundred are being installed along the airways for visual and radio beacons and ten in lighthouses, giving reliable, automatic, independent electric power that safeguards life and property. Other governmental users include the Army and Navy, the Department of Justice (standard and emergency lighting for prisons and prison camps), National Park Service, Indian Irrigation Service, Commission of Forestry and the Coast Guard. Scores of these plants are used on cruisers and destroyers.

Kohler Electric Plants generate current at 110 volts D. C., or 3-phase 220 volts A. C. Capacities from 800 watts to 10 K. W. They make night work practical, safe and profitable. For floodlights, operating motors, pumps, air compressors, lathes, portable electric tools. Kohler Plants are compact, rugged, self-contained and can be transported over rough country without damage. They operate without storage batteries. For complete information, send the coupon today. Kohler Company. *Founded* 1873. Kohler, Wis.—*Shipping Point*, Sheboygan, Wis.—*Branches in principal cities*. . . . Manufacturers of Kohler Plumbing Fixtures.

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ELECTRIC PLANTS

KOHLER CO., Kohler, Wisconsin EE 5-30
Gentlemen:
Please send catalog describing Kohler Electric Plants.
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*Use in which interested*_____

SHOTS FROM THE FIRING LINE — Continued

Southern Notes

BY W. W. WHORLEY

According to Operator Tucker of the Bucyrus-Erie D-2 dragline owned by the **East Baton Rouge Parish Road Commission,** this machine has been making a splendid record on output and maintenance cleaning out old ditches. Mr. Tucker is to be commended for his good care of this machine.

George Harden, who has been handling a Bucyrus-Erie GA-2 for the **Shultz Construction Company** of Oklahoma City, is very enthusiastic about the way this shovel handles, and claims that it is no trouble to load 1000 yards per shift.

Bill Thornton, who has been handling various shovels for **Jerry Gwin,** paid us a visit recently.

C. A. Tenney, who is operating one shift on a Bucyrus-Erie Class-230 dragline for the **Grasser Contracting Company,** reports that they have made excellent progress on a levee job along the Bayou De Glaise, in spite of unfavorable weather conditions.

Vader Roberts, who is handling a Bucyrus-Erie 31-B for J. B. Turner near Clanton, Alabama, paid us a visit recently.

Bruce Dickson and Homer Ragan, who have been operating draglines for the Roquemore Gravel Company, were recent callers at this office.

John Roberts, who has been handling a Bucyrus-Erie B-2 for the Crippen Construction Co. on a railroad job in Kansas, showed up recently with a healthy tan. It seems like Kansas-agreed with you, John.

In spite of unfavorable weather conditions, **Lewis-Chambers Construction Company** are making excellent progress on their levee job at Morganza. Two Bucyrus-Erie Class-230 steam draglines are being used under the capable supervision of A. H. Milam and R. J. Phillippe.

INSURANCE
IS NO GAMBLE » »
IT'S GOOD BUSINESS » »
BUT TO BE WITHOUT AN
EXTRA ROPE ON HAND
»» WELL » »

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IT
OVER

Bucyrus-Erie selected wire rope is chosen for your machine—for your work—the result of extensive field and laboratory study and tests.

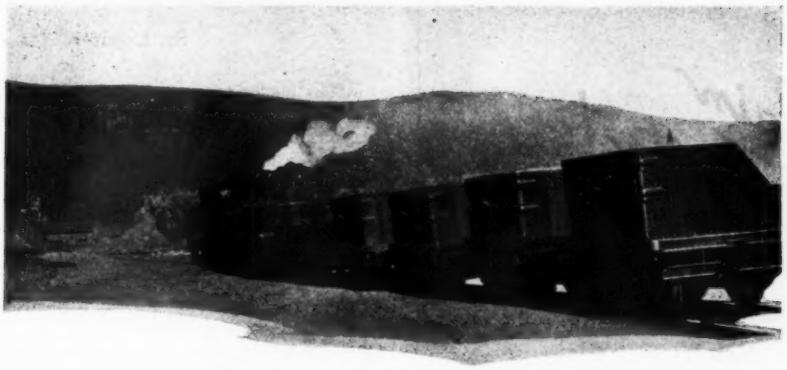
Order your next wire rope from Bucyrus-Erie. You will be satisfied that proper selection is as important as proper care.

BUCYRUS-ERIE COMPANY
SPECIALTY DEPARTMENT
South Milwaukee, Wisconsin
BUCYRUS ERIE

A New Way to do it

PAGE DRAG SHOVEL
Can be fitted to all standard makes of machines.
Puts New Life and Speed into any Job.
Cuts clean—Digs deep
Locates spoil bank at a distance, no premature spilling.
The Hinged Bucket revolutionizes Past Methods.
Pictured is a Page Drag Shovel fitted on a 50-B Bucyrus Machine 1½-yard Bucket (40½ Cubic Feet capacity).
Ask for Bulletin 900.

PAGE ENGINEERING CO. 844 RUSH ST. CHICAGO — ILL.
DRAG SHOVELS—DRAG LINES—BUCKETS—SLACK LINES—DIESEL ENGINES



FIVE SHAY ADVANTAGES THAT ASSURE DEPENDABLE HAULING

HERE are five advantages of Shay Geared Locomotives that tell why this rugged power plant fits in so well on excavating and quarrying operations.

1. Their flexible geared drive enables Shays to go anywhere a car will follow;
2. On straight track and average grades Shays have the power to outwork rod engines of equal weight;
3. On rough, crooked track and steep grades—where rod engines are helpless—Shays operate successfully;
4. Their multi-cylinder engines give Shays a strong, uniform pull, like an electric motor;
5. Their low wheel loads and absence of driving wheel counterbalance enable Shays to operate on light-weight rail, over earth roadbeds.

If you are considering the selection of a new hauling power investigate the Shay. Ask for a copy of the Shay catalog and more information on Shay advantages.

LIMA LOCOMOTIVE WORKS

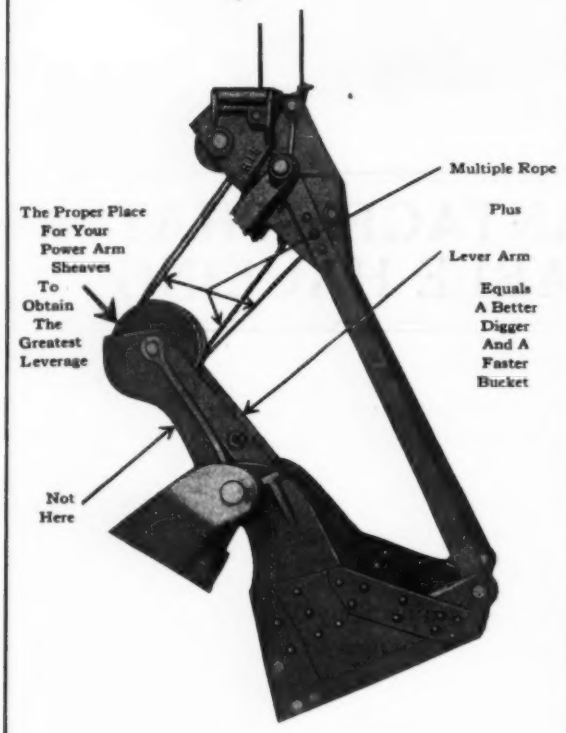
Incorporated

Lima, Ohio 17 East 42nd St., New York

LIMA SHAY GEARED LOCOMOTIVES

In writing to Lima Locomotive Works, Incorporated, please use coupon or post card bound in the center of this number.

Just Plain Facts!


The Proper Place For Your Power Arm Sheaves To Obtain The Greatest Leverage
Multiple Rope Plus Lever Arm Equals A Better Digger And A Faster Bucket
Not Here

More Yardage Per Trip

Erie Buckets dig more yardage per trip because they are designed correctly. For instance: The power arm sheaves are placed at the extreme end of the power arm so as to obtain the greatest leverage. The scoops are correctly shaped so as not to lift out of the materials while closing. The combination of the lever arm and block and tackle principles gives greater power than either one alone.

More Trips per Day

Erie Buckets are speedier because there is less line to overhaul. This is due to their low headroom.

Less Maintenance

The cable is without S bends and leads over large diameter sheaves. It is protected in the head by rollers on all four sides. Few and rugged parts which are properly lubricated also help keep maintenance at a minimum.

Buckets shipped the same day the order is received.

"Since putting on your bucket we have added an extra truck to haul the dirt away."

A Cleveland Contractor.

A Catalog is yours for the asking.

ERIE STEEL CONSTRUCTION CO.

ERIE BINS — CLAMSHELL AND ELECTRIC BUCKETS — PENNA. AGGREMETERS

SHOTS FROM THE FIRING LINE — Continued

St. Louis Notes

BY A. J. KOENIG

A low bid of $358,238 was tendered by **Frazier-Davis Construction Co., St. Louis,** for the construction of the Biddle Street relief sewer in St. Louis. This sewer will be laid beneath O'Fallon Street, between High Street and the Mississippi River, approximately 4000 feet in length. Six bids were received on this project. Low bid was 9 per cent under engineer's estimate.

Willbanks & Pierce, Inc., Vicksburg, Mississippi, were awarded contract by the United States Engineers for levee construction work amounting to 1,975,000 cubic yards at $641,282; **J. H. Boyce Sons Co., Roy L. Igo of Memphis, Tennessee,** were granted contract for levee construction work for 570,000 cubic yards at $356,475. These two sections will be part of the "fuse plug" levee between Bird's Point and New Madrid, Missouri. Work will start about June 15th.

Henderson Construction Co. was awarded contract for grading of State Highway No. 10, from Hardin to Norborne, Missouri, a distince of 10.3 miles. Work will begin about March 15. Arthur Leach of Omaha has a contract for grading from Hardin to Richmond on this road.

Pioneer Construction Co., Kansas City, has contract for levees and drainage ditches in Howard County, Missouri. Price $32,000.

Peterson, Shirley & Gunther, Omaha, Nebraska, have a contract from the Chicago, Rock Island & Gulf Railway for the grading of sixty-five miles of single track line from Dalhart to Morse, Texas.

Edw. J. Eiff & Co. were low bidders on the grading and paving of seven miles of county road on U. S. 24, Blue Mills-Sibley Road.

In the World's Largest Quarry

On the waste dump and in the quarry of the world's largest producer of limestone, these two Track Machines have replaced the large track gang formerly used for shifting and raising track. On any shifting and raising job, this machine soon pays for itself out of labor savings.

Write for Bulletin GR-8.

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED TRACK MACHINE

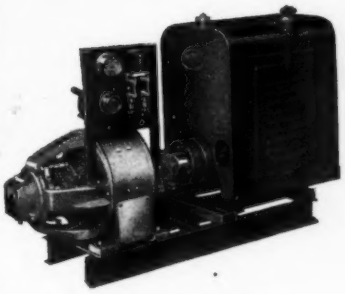
TURNING NIGHT INTO DAY

SHOVELS, dredges, cranes, and men can be kept working throughout the night as efficiently as during the day.

For Novo Flud-Lite Lighting Units provide clear, unfailing, flickerless light all night long.

And only one gallon of gasoline is needed to generate 1,000 watts for eight hours.

That's cutting the cost of lighting night shifts right down to the core. But Novo Flud-Lite Lighting Units don't stop there.



Novo Flud-Lite Unit with standard generator and Novo Rollr Engine

They are unusually compact and light in weight. They operate without vibration. They require only a quarter turn, right hand crank to start. And because they are powered by the famous Novo Rollr Engines, with Timken Roller Bearings on the crank shaft, long life with little attention is assured.

Novo Flud-Lite Lighting Units range in size from 1¼ to 25 K.W. Write for the folder.

NOVO ENGINE COMPANY, 222 Porter Street, Lansing, Mich.

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NOVO Flud-Lite Lighting Units

Service, parts and sales in over 70 cities

In writing to Novo Engine Company please use post card bound in the center of this number.

SHOTS FROM THE FIRING LINE — Continued

Washington Notes

BY J. P. MC CLOSKEY

A. L. Aukamp, Yakima, has been awarded contract for the rebuilding of four and one-half miles of State Highway between Lowden and Touchet. The contract involves 72,560 cubic yards of excavation and 16,130 cubic yards of crushed stone. The low bid amounted to $56,870.41.

Triangle Construction Co., Spokane, was low bidder for the reconstruction of three and one-half miles of State Road near Diamond Lake South in Pend Oreille County, involving 49,140 cubic yards of excavation. Their bid was $67,743.76.

Hart, Chapman and Shaughnessy, Auburn, with a bid of $4,990 was awarded contract for construction work on State Highway No. 9 near Blyn.

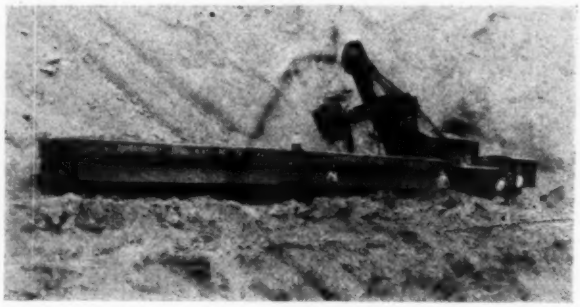
San Francisco Notes

BY HARVEY L. LIVINGSTON

Sharp & Fellows Contracting Co., of Los Angeles has been awarded contract for the construction of 23 miles of second main line between Winslow and Joseph City, Arizona, for the Santa Fe Railroad. The work will involve roadbed grading, construction of concrete foundations for widening of two steel bridges, and construction of a number of timber bridges, culverts, and headwalls.

Washoe County Conservation District, of Reno, Nevada, has filed application for the appropriation of 50,000 cubic feet per annum storage from Little Truckee River in Sierra County, for irrigation on 32,840 acres. The stored water is to be transported through the Little Truckee River and Truckee to a distribution system now complete. Work involves an earth-fill dam 142 feet high and 700 feet long on top.

Frank Martin and Glenn Royer, who have been operating 50-B Bucyrus-Erie Diesel shovels for the Red River Lumber Company of Westwood, California, left recently for Venezuela, Central America, to operate Bucyrus-Erie Diesel draglines for the Martin Engineering Company of New York.



Before work on the San Gabriel Dam was abandoned, due to failure to find proper footing for foundations, **Fisher-Ross-MacDonald & Kahn, Inc.**, made some records with their Bucyrus-Erie 120-B shown above which attracted universal attention among excavating men in Southern California. This heavy-duty 4-yard electric was averaging 3000 cubic yards per eight-hour shift when the job tied up. 30-yard Westerns and 20-ton Plymouths were handling the hauling.

BY D. W. EVANS

W. A. Bechtel Company of San Francisco has been awarded contract for extension of side tracks in Feather River Canyon work consisting of grading, track laying, and ballasting, involving 150,000 cubic yards of excavation.

H. R. Lowell of the Northern Redwood Lumber Company at Korbel, California, reports that their ¾-yard Bucyrus-Erie 1030 is working well on their new logging railroad extension. Joe Weber is running the machine.

Hoisting Chain of Quality

Bucyrus-Erie Hoisting Chain is made of a special grade of re-rolled and refined muck bar iron and is free from steel and scrap. Each link is individually shaped and welded when the proper temperature for such operation has been reached.

Your shovel will have greater efficiency if equipped with Bucyrus-Erie Hoisting Chain. Using the right size for your machine is an important factor contributing to its production. Let Bucyrus-Erie engineers select the chain that will give you maximum output.

Write for Bulletin mentioning the size of your machine.

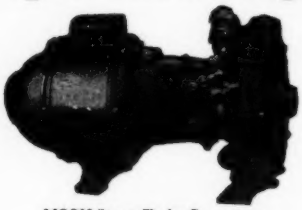
BUCYRUS-ERIE COMPANY

BUCYRUS ERIE

SPECIALTY DEPARTMENT

South Milwaukee, Wisconsin

Your Night Crew needs Dependable Light



MOON Steam Turbo Generators
Capacities — 1 to 4 K W

GIVE your night crew a MOON generator to light up their night operations, and watch their production step up.

Absolutely reliable in performance, simple to operate, economical — these are the features which are responsible for the large number of MOONs you find in service on construction jobs today.

Let us tell you how the MOON can handle *your* lighting job.

Write for descriptive Bulletin No. 16-V.

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